UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF SOCIAL STATISTICS

AN ANALYSIS OF THE COMPONENTS OF MIGRATION:
VIANA DO CASTELO, MINHO, 1826-1931

by

Arno Kitts

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ABSTRACT

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AN ANALYSIS OF THE COMPONENTS OF MIGRATION:
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Over the last 500 years, emigration has played an integral part in the evolution of the demographic structure of Portugal. Initially, its purpose was the colonisation of Portugal's overseas territories. This was gradually overshadowed by its function as an opportunity for individuals to seek improved circumstances. During the last 100 years or so, emigration from Portugal reached levels surpassing those of most other European countries, and the country registered a net population loss second only to that of Ireland.

As the nineteenth century progressed, return migration became an increasingly important phenomenon throughout Europe. In Portugal, this manifested itself in the myth of fortune and return. Remittances from emigrants had always had an influence on the economy, but in the late nineteenth century the economy of northern Portugal in particular was influenced by the **Brasileiros**, native born Portuguese who emigrated to Brazil to make their fortune and returned to Portugal to display their success.

The quantitative importance of Portuguese emigration has not been reflected in the literature; many of the major issues in European emigration have not yet been approached with respect to Portugal. Also, return migration has not been studied extensively; most notably, its levels, its impact on the economy, and the demographic structure of the return migrants have been under-explored.

This thesis considers population change at two levels in order to identify and examine the components of migration to and from the Port-city of Viana do Castelo, and its hinterland (the northernmost district of Portugal). Aggregate data from the passport books and censuses of 1864, 1878, 1890 and 1900 are supplemented by a database of individual-level data drawn from manuscript sources compiled in the City: muster-rolls, 1826-1833; electoral registers, 1834-1931; passport books, 1835-1896; and cemetery lists 1855-1922.

Changes in the level and structure of emigration from the District of Viana are identified using log-linear models of emigration rates, and the extent of clandestine emigration is investigated using a simple model of population change. The reconstitution of the Port-City of Viana do Castelo is described in detail, focusing on the software and techniques developed for the record linkage. Components of migration to and from Viana are identified for the whole population, and for the elite (a sub-group of the electorate). Migration of the elite is also inferred and examined using survival analysis techniques.

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CHAPTER 1

INTRODUCTION: THE SCOPE OF THE STUDY

Over the last 500 years, emigration has played an integral part in the evolution of the demographic structure of Portugal. Initially, its purpose was the colonisation of Portugal's overseas territories. This was gradually overshadowed by its function as an opportunity for individuals to seek improved circumstances. During the last 100 years or so, emigration from Portugal reached levels surpassing those of most other European countries, and the country registered a net population loss second only to that of Ireland.

Historically, while migration has always been as constant a demographic phenomenon as fertility or mortality, it assumed a new dimension when the first voyages of discoveries excited European interest in many far-flung potential sources of wealth. The importance of colonist settlements in the race to claim newly discovered lands during the following centuries cannot be over-estimated.

During the century between the end of the Napoleonic Wars and the outbreak of the First World War, the European economy expanded as a result of enormous technological achievements, causing a drastic reorganisation of employment patterns. Consequently, emigration was pushed to levels previously unknown and subsequently unrepeated, as people poured out of Europe in ever increasing numbers to less-settled parts of the world.

Further, as the nineteenth century progressed, and travel time was sharply reduced with the increasing use of steam-travel, return migration assumed a new importance throughout Europe. In Portugal, remittances from emigrants had always had an influence on the economy, but in the late nineteenth century the economy of northern Portugal in particular was influenced by the **Brasileiros**, native born Portuguese who emigrated to Brazil to make their fortune and returned to Portugal to display their success.

The quantitative importance of Portuguese emigration has not been reflected in the literature; many of the major issues in

European emigration have not yet been approached with respect to Portugal. Also, return migration has not been studied extensively; most notably, its levels, its impact on the economy, and the demographic structure of the return migrants have been under-explored.

This thesis considers population change at two levels in order to identify and examine the components of migration to and from the Port-city of Viana do Castelo, and its hinterland (the northernmost district of Portugal). Aggregate data from the passport books and censuses of 1864, 1878, 1890 and 1900 are supplemented by a database of individual-level data drawn from manuscript sources compiled in the City: muster-rolls, 1826-1833; electoral registers, 1834-1931; passport books, 1835-1896; and cemetery lists 1855-1922.

Changes in the level and structure of emigration from the District of Viana are identified using log-linear models of emigration rates, and the extent of clandestine emigration is investigated using a simple model of population change. The reconstitution of the City of Viana is described in detail, focusing on the software and techniques developed for the record linkage. Components of migration to and from the City of Viana are identified for the whole population, and for the elite (members of the electorate with names consisting of at least three components). Migration of the elite is also inferred and examined using survival analysis techniques.

Chapter 2 surveys the literature on migration. First, traditional and contemporary theories and models of migration are discussed. Theories and models of migration can be broadly classified as causal or impact theories, which can be formulated at three levels: the individual, the household, and larger, more anonymous groups. Also, migration theories fall into one of the following two categories: those which have been developed quantitatively, and those which have not. Further, migration theories are strictly divided into those which are described as equilibrium models, and those which are said to assume a historical-structural perspective; it is argued that the latter produce forces of the type incorporated in the former.

The discussion of theories and models of migration presupposes that movements have been identified and classified along some

criteria. In historical demography this supposition is rarely justified, and the researcher is often forced to adopt indirect methods in order to identify migration. The identification of migration is divided according to the evidence on which it is based; studies relying on direct, indirect, and, more recently, inferential evidence of migration are reviewed.

Whichever source of evidence of migration is used, once a movement is identified, it must be carefully classified for the purposes of analysis, and to ensure the that the results from different studies are comparable. Migration flows are classified according to components such as in-migration and out-migration, emigration, legal emigration and clandestine emigration, return migration, and repeat migration; and also according to other criteria, such as whether they are temporary or permanent, short or long distance, rural to urban, etc..

Having established an analytical framework for the study of migration, emigration from Europe during the century between the end of the Napoleonic Wars and the outbreak of the First World War is discussed, focusing on issues such as the origins, characteristics, and destinations of emigrants, and the substantial levels of return migration witnessed from the late-nineteenth century. In particular, the failure of traditional theories of loss of land, over-population, industrialisation, and urbanisation as explanations of trends in the level and characteristics of these emigrations is examined.

From this juncture, emigration from Portugal is introduced within the constraints imposed by the paucity of the statistics available for the sixteenth century. It emerges that a study of Portuguese emigration would be meaningless without a discussion of Brazilian immigration; during the nineteenth and early-twentieth centuries Brazil absorbed the vast majority of Portuguese emigrants, and almost a third of all immigrants to Brazil were Portuguese.

Initially, Brazilian immigration policies were designed to promote colonisation. However, during the nineteenth century, these were gradually augmented and finally replaced by policies which were primarily designed to guarantee an elastic supply of labour. The politics of Brazilian immigration in the nineteenth century are therefore associated with one or other of two distinct immigration flows: the establishment of small colonist settlements, and the import of free wage-labourers to replace slaves. It is the latter

flow which turned into the mass immigration witnessed in the late-nineteenth and early-twentieth centuries. It is noted however, that despite the frequency and size of the great waves of immigration to Brazil, the substantial increase in the Brazilian population during the same period was attributable more to high fertility and low mortality than to immigration.

Returning to Portugal, the considerable role that emigration played in the evolution of the demographic structure of the country over the last 500 years simultaneously ensured its adoption as a topic of much dissent. Historically, attitudes to emigration were complex, with society undecided as to whether emigration was a good or bad thing. Thus, governments remained wary of directly prohibitive measures in fear of the strong reactions that might be provoked. Turning to the nineteenth century, the roots of governmental concern at the levels of emigration are uncertain, but it is likely that increasing numbers of males failing to report for military service, and unofficial details of clandestine emigration led to the introduction of legislation designed to curb this trend. The politics of Portuguese emigration are discussed, and important bodies of nineteenth-century legislation concerning emigration are summarised.

Finally in Chapter 2, studies of Portuguese emigration are reviewed. In comparison with the literature of European emigration, even the work of contemporary Portuguese scholars tends to be rather poor. Essentially, this is because there has hitherto been a heavy reliance on anecdotal information, and a (closely associated) tendency to assume a historical-structural perspective of migration, thereby avoiding any detailed (quantitative) analysis. Many of the issues in European emigration have not even been approached with respect to Portugal. The detailed identification of the process of emigration has remained largely speculative because of the lack of systematically collected statistics. Nevertheless two themes have remained central, the strong association of early emigration with commerce, and the later exodus with the system of agriculture practised in the north-west of the country. These themes are corroborated by a vast amount of anecdotal information, and some quantitative evidence.

The review of studies of Portuguese emigration is divided into several topics: emigrants characteristics, clandestine emigration,

return migration, and emigrant remittances. Clandestine emigration consisted of two streams: that of males aged 14-21, who were unable to obtain passports because of military conscription legislation, and that consisting of people for whom the price of a passport was prohibitively high. The discussion of return migration is centred upon the myth of fortune and return which still persists today; the **mineiro de torna viagem** (return migrant miners) of the eighteenth century became the **Brasileiro** (return migrant from Brazil) of the nineteenth, who, in turn, has become the **Francês** (return migrant from France) of the late twentieth century. With respect to remittances, although it is known that Portugal's fragile economy of the nineteenth century came to rely heavily on the income generated by the remittances and return of its emigrants, very little quantitative evidence is actually available. In conclusion, a broad comparison of the characteristics of the Portuguese emigrants with those of other European countries illustrates that Portuguese emigration possessed some unique features. First, emigrants were predominately male until relatively recently. Second, in the nineteenth century, a large proportion of these male emigrants were young, often less than 14 years old. Third, the proportion of emigrants departing individually was decreasing in Portugal, while it was increasing throughout most of Europe. Finally, while the extent of return migration increased elsewhere, in Portugal it decreased.

Chapter 3 examines aggregate emigration data for the District of Viana (the Alto Minho) during the second half of the nineteenth century. First, the agriculture, population and technological development of the District are described in detail, in order to identify important economic and demographic characteristics of the area under consideration. Changes in the level and structure of emigration from the District are identified by comparing emigrant characteristics (available from the passports issued in the three census years 1864, 1878, and 1890), with those of the population from which the emigrants were drawn (available from the censuses) using log-linear models of emigration rates. The analysis is supplemented by the application of a simple model of population change which enables the extent of clandestine emigration to be investigated.

The paucity of aggregate demographic statistics for nineteenth century Portugal forces various sources of ancillary data to be exploited fully. An increasingly popular approach involves the reconstitution of one town or city using a database of several manuscript sources; these enable micro-level analyses to be performed, which enhance the understanding of the secular demographic trends that are derived from those aggregate statistics that are available.

The City of Viana do Castelo, situated on the northern bank of the mouth of the River Lima, provides an ideal opportunity for the investigation of these phenomena through the reconstitution of its population from the abundance of records generated by the Portuguese administrative system. With a population of just less than 10,000 during the nineteenth century, it is large enough to limit the effects of random variation, while not too large to preclude close examination of the individual-level data. In addition, its role as the administrative centre and principal port of the District of Viana offers the study of stage migration of the rural peasantry, and the migration of both the urban poor and elite.

Chapter 4 describes the reconstitution of the City of Viana do Castelo. First, the economic and demographic history of the City is discussed, and local and national events in the nineteenth century are summarised in order to establish the circumstances under which the sources being used were created. Aggregate census data are used to provide an initial picture of the population. The manuscript sources (muster-rolls, electoral registers, passport books, and cemetery lists) on which the reconstitution is currently based are then described in detail.

Reconstitution methodology is introduced with a review of record linkage techniques. Record linkage studies are classified according to whether or not variation and errors exist in identifying items of information, and whether or not there is duplication of identifying item sets. The combination of these problems determines the approach to record linkage. Nevertheless, it is argued that whatever approach is adopted ought to be fully automatic; ensuring both that linkage criteria are carefully defined beforehand, and that those criteria are consistently applied.

In order to enable records to be linked both within and between documents for subsequent analysis, several operations - the software requirements of record linkage - must be possible. One way to satisfy these requirements is to store the data in a powerful database. Reasons for choosing the Scientific Information Retrieval (SIR) Data Base Management System (DBMS) for the storage, standardisation and coding, linkage, and subsequent retrieval of the Viana data are discussed, together with the actual software and techniques adopted.

In Chapters 5, 6 and 7, analyses of components of migration are presented, examining evidence of migration to and from Viana during the period 1826-1931.

Chapter 5 uses the muster-rolls to provide a picture of the population, and migration to and from Viana. The muster-rolls are the only systematically collected source of demographic data available for Portugal during the period 1820-1835. As such, they provide an ideal opportunity for the study of the structure of the country's population in the years spanning the civil war of 1828-1834, which preceded the reforms that were introduced following the advent of liberalism in 1834.

The advantage of a household listing compiled at one point in time and then repeatedly updated is that not only is it possible to examine the population at the time the document was first drawn up, but also to investigate the dynamics of the population over a period of time. Thus, besides identifying the levels of mobility, this Chapter provides a base population for reference in those that follow. Unfortunately however, those included on the muster-rolls did not constitute the entire population, as spinsters and widows who were not heads of households and who did not have male children were excluded.

The analysis of the muster-rolls demonstrates that substantial levels of male migration to, within, and from, but not back to, Viana existed during the period 1826-1833. However, due to the nature of the muster-rolls, comparatively little is known about the destinations of out-migrants, and virtually nothing is learnt about the mobility of the female population.

Chapter 6 presents evidence of migration to and from Viana during the period 1835-1922 which allows these issues to be addressed. Two main components of migration are examined: first, trends in in-migration are identified from birthplace information recorded on the cemetery lists; second, trends in emigration are identified from the passport books.

Unlike the muster-rolls, both the documents analysed in this Chapter were compiled for the whole population of Viana; nobody was specifically excluded from appearing; however, considering the passport books, clandestine emigrants remain elusive. Further, neither of the analyses presented is dependent on the record linkage process; they are performed on data aggregated from the manuscript sources.

On the one hand, the first analysis indicated substantial levels of female migration, and suggests that the level of out-migration from the City was significantly higher for natives of Monserrate than for those who had been born in Santa Maria Maior. On the other hand, the second analysis illustrates the virtual absence of females among emigrants until the late nineteenth century, and that natives of the two parishes of Viana were roughly equally likely to emigrate legally. Combining the evidence of both analyses, it is suggested that natives of the less prosperous parish - Monserrate - were more likely to migrate to other parts of Portugal, or to emigrate without a passport. Similarly, females were more likely to migrate to other parts of Portugal, but it is unlikely that many emigrated without passports.

The analysis of the passport books provides a detailed picture of emigration from Viana during the nineteenth century, illustrating that the majority of emigrants were single males less than 21 years old, often being sent to Brazil to avoid military conscription. Also, a significant proportion of emigrants from Viana are shown to be stage migrants, mainly from Viana's immediate hinterland, but with some from further afield.

However, two components of migration remain beyond the scope of this Chapter: return migration and repeat migration. The identification of these components is entirely dependent on the record linkage process, and is therefore only discussed in Chapter 7, in the context of migration of the elite, for whom the record linkage described in Chapter 4 is most accurate.

Chapter 7 examines evidence of migration among a sub-group of the electorate of Viana. This sub-group is defined as those individuals with recorded names consisting of three or more components who appear at least once on the electoral registers. The former part of this definition is necessary because the reconstitution of the population of Viana is currently restricted to males with recorded names consisting of three or more components. This sub-group of the electorate is referred to as the elite because there is known to have been an association between socioeconomic status and the number of components of Portuguese names. Of course, it is noted that for a definition of$_{\alpha}$particular group this approach is somewhat simplistic; for example, individuals with three or more component names who were, recorded on electoral registers with just two or less component names are simply omitted.

In studying the migration of the urban elite, the time elapsing between the arrival of an individual, whether by birth or in-migration, and their subsequent departure at some later date, whether by out-migration or death, is of interest. Survival analysis is a method by which the time elapsing between two such predefined events is studied. Some important issues in survival analysis are therefore reviewed with respect to the study of migration of the elite. Survival analysis is introduced in its earliest form - traditional life table analysis. The development and limitations of the proportional hazards model are discussed; approaches to the problem of unobserved heterogeneity are reviewed; mixture models are considered; and finally, alternative observational plans are described.

The electorate of Viana is identified, described, and compared with the population from which it was drawn. Trends in the size and characteristics of the electorate are described, and log-linear models are used to compare the characteristics of the electorate in the census years of 1864 and 1878 with the population from which it was drawn. Also, a similar analysis is performed to identify the elite - the sample of the electorate with names consisting of three or more components. The elite are found to be a slightly biased sample of the electorate, weighted in favour of residents of the parish of Santa Maria Maior during the period 1850-1878, who were unmarried, and were engaged in commerce, the armed forces, public administration, or the professions.

Migration of the elite is analysed through an examination of indirect, and inferential evidence of temporary and permanent absence from Viana. Of course, the analysis is dependent on the record linkage of the muster-rolls, electoral registers, passport books, and cemetery lists. References to possible inaccuracies of the record linkage are therefore discussed where appropriate. First, the retrieval of a statistical file of individual life histories from the database is described. Second, restriction of the dataset is considered in the context of the circumstances under which the original manuscript sources were created. Third, several exploratory analyses of the restricted elite are described; these provide some initial insight into the generation of individual life histories, while also serving to verify the quality of the data. Fourth, indirect evidence of migration of the elite is examined; the passport book records are used to provide estimates of emigration, stage migration, return migration and repeat migration. The analyses suggest that the level of emigration exceeded 5%. Of these emigrants, a considerable proportion (25-49%) were stage migrants; return migration was estimated to be of the order of 70-87%; and, of these return migrants, 25% later became repeat migrants.

Finally, inferential evidence of migration of the elite is examined; in particular, models of duration on the electoral registers are estimated. The analysis suggests that while out-migration (excluding emigration) was not significantly dependent on age, or marital status, there were large occupational differentials, and significant period effects.

Finally, in Chapter 8, the important issues addressed in this thesis are synthesised, and the main results of the analyses are summarised. The Chapter concludes with some suggestions for further research within the field in general, and with respect to the Viana Project in particular.

CHAPTER 2

A SURVEY OF THE LITERATURE

2.1 Introduction

Over the last 500 years, emigration has played an integral part in the evolution of the demographic structure of Portugal. Initially, its purpose was the colonisation of Portugal's overseas territories. This was gradually overshadowed by its function as an opportunity for individuals to seek improved circumstances. During the last 100 years or so, emigration from Portugal reached levels surpassing those of most other European countries, and the country registered a net population loss second only to that of Ireland.

While migration has always been as constant a demographic phenomenon as fertility or mortality, it assumed a new dimension when the first voyages of discoveries excited European interest in many far-flung potential sources of wealth. The importance of colonist settlements in the race to claim newly discovered lands during the following centuries cannot be over-estimated. Initially, the colonist may well have been accompanied by the slave; only later were they joined by the emigrant[1].

During the century between the end of the Napoleonic Wars and the outbreak of the First World War, the European economy expanded as a result of enormous technological achievements, causing a drastic reorganisation of employment patterns. Consequently, emigration was pushed to levels previously unknown and subsequently unrepeated, as people poured out of Europe in ever increasing numbers to less-settled parts of the world. Further, as the nineteenth century progressed, and travel time was sharply reduced with the increasing

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[1] It is important to distinguish between these three types of migrant: the individual abandoning his homeland on the initiative of the state (colonist), the one forced to leave without his consent (slave), and the one leaving through personal motives only (emigrant).

use of steam-travel, return migration became an increasingly important phenomenon throughout Europe.

To return to Portugal, a comparison of the country's size and population with the powerful role that its Empire played in world affairs during the centuries following the earliest discoveries, suggests that it ought not to be surprising that travel overseas was a common event. Indeed, many authors (e.g. Brettell, 1986:73) suggest that Portuguese emigration in particular is deeply associated with the "spirit of adventure and of looking elsewhere" instilled in Portuguese national consciousness during more than three centuries of exploration.

Perhaps more than other colonial empires, Portugal became increasingly dependent on the wealth produced by its overseas territories, and was therefore careful to retain their administration on native soil. Consequently, an ideology of return migration was fostered which generated financial flows - remittances - from those temporarily abroad. Remittances had long had an influence on the economy of Portugal, but by the late nineteenth century northern Portugal in particular was influenced by the **Brasileiros** (native born Portuguese who emigrated to Brazil to make their fortune and returned to Portugal to display their success).

By the end of the nineteenth century, emigration from Portugal, whether with a view to prospective return or not, was increasing rapidly, and continued to to so, reaching levels surpassing those of most other European countries. Between 1864 and 1973, with the exception of Ireland, Portugal registered the highest net population loss in Europe (Keefe, 1977:95-6)[2], most of which was lost during the twentieth century. The close comparison of the emigration experiences of these two countries is taken even further by Harris (1983:50), who, examining the Intra-European labour movements of the 1960s and early 1970s, goes so far as to suggest that "... northern Portugal, like parts of southern Ireland, was depopulated ...".[3]

This Chapter discusses the characteristics of these emigrations and is structured as follows. First, in Section 2.2, traditional and

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[2]Cited by Mendonsa (1982:635).

[3]For example, in the period 1961-1970, more than 680,000 emigrants (drawn from a population of under 10 million) left Portugal (Alarcão, 1976:246).

contemporary theories and models of migration are discussed. Theories and models of migration can be broadly classified as causal or impact theories, which can be formulated at three levels: the individual, the household, and larger, more anonymous groups. Also, migration theories fall into one of the following two categories: those which have been developed quantitatively, and those which have not. Further, migration theories are strictly divided into those which are described as equilibrium models, and those which are said to assume a historical-structural perspective; it is argued that the latter produce forces of the type incorporated in the former.

The discussion of theories and models of migration presupposes that movements have been identified and classified along some criteria. In historical demography this supposition is rarely justified, and the researcher is often forced to adopt indirect methods in order to identify migration. The identification of migration is divided according to the evidence on which it is based; studies relying on direct, indirect, and, more recently, inferential evidence of migration are reviewed.

Whichever source of evidence of migration is used, once a movement is identified, it must be carefully classified for the purposes of analysis, and to ensure the that the results from different studies are comparable. Migration flows are classified according to components such as in-migration and out-migration, emigration, legal emigration and clandestine emigration, return migration, and repeat migration; and also according to other criteria, such as whether they are temporary or permanent, short or long distance, and rural to urban.

In Section 2.3, emigration from Europe during the century between the end of the Napoleonic Wars and the outbreak of the First World War is discussed, focusing on issues such as the origins, characteristics, and destinations of emigrants, and the substantial levels of return migration witnessed from the late-nineteenth century. In particular, the failure of traditional theories of loss of land, over-population, industrialisation, and urbanisation as explanations of trends in the level and characteristics of these emigrations is examined.

In Section 2.4, emigration from Portugal is introduced within the constraints imposed by the paucity of the statistics available for the sixteenth century. It emerges that a study of Portuguese

emigration would be meaningless without a discussion of Brazilian immigration; during the nineteenth and early-twentieth centuries Brazil absorbed the vast majority of Portuguese emigrants, and almost a third of all immigrants to Brazil were Portuguese.

In Sections 2.5, the politics of Brazilian immigration are discussed in detail. Initially, Brazilian immigration policies were designed to promote colonisation. However, during the nineteenth century, these were gradually augmented and finally replaced by policies which were primarily designed to guarantee an elastic supply of labour. The politics of Brazilian immigration in the nineteenth century are therefore associated with one or other of two distinct immigration flows: the establishment of small colonist settlements, and the import of free wage-labourers to replace slaves. It is the latter flow which turned into the mass immigration witnessed in the late-nineteenth and early-twentieth centuries. It is noted however, that despite the frequency and size of the great waves of immigration to Brazil, the substantial increase in the Brazilian population during the same period was attributable more to high fertility and low mortality than to immigration.

In Sections 2.6, the politics of Portuguese emigration are discussed in detail, and important bodies of nineteenth-century legislation concerning emigration are summarised. The considerable role that emigration played in the evolution of the demographic structure of the country over the last 500 years simultaneously ensured its adoption as a topic of much dissent. Historically, attitudes to emigration were complex, with society undecided as to whether emigration was a good or bad thing. Thus, governments remained wary of directly prohibitive measures in fear of the strong reactions that might be provoked. Turning to the nineteenth century, the roots of governmental concern at the levels of emigration are uncertain, but it is likely that increasing numbers of males failing to report for military service, and unofficial details of clandestine emigration led the government to introduce legislation designed to curb this trend.

In Section 2.7, studies of Portuguese emigration are reviewed, focusing on past and present issues of importance. In comparison with the literature of European emigration, even the work of contemporary Portuguese scholars tends to be rather poor. Essentially, this is because there has hitherto been a heavy reliance

on anecdotal information, and a (closely associated) tendency to assume a historical-structural perspective of migration, thereby avoiding any detailed (quantitative) analysis. Many of the issues in European emigration have not even been approached with respect to Portugal. The detailed identification of the process of emigration has remained largely speculative because of the lack of systematically collected statistics. Nevertheless two themes have remained central, the strong association of early emigration with commerce, and the later exodus with the system of agriculture practised in the north-west of the country. These themes are corroborated by a vast amount of anecdotal information, and some quantitative evidence.

The review of studies of Portuguese emigration is divided into several topics: emigrants characteristics, clandestine emigration, return migration, and emigrant remittances. Clandestine emigration consisted of two streams: that of males aged 14-21, who were unable to obtain passports because of military conscription legislation, and that consisting of people for whom the price of a passport was prohibitively high. The discussion of return migration is centred upon the myth of fortune and return which still persists today; the **mineiro de torna viagem** (return migrant miners) of the eighteenth century became the **Brasileiro** (return migrant from Brazil) of the nineteenth, who, in turn, has become the **Francês** (return migrant from France) of the late twentieth century. With respect to remittances, although it is known that Portugal's fragile economy of the nineteenth century came to rely heavily on the income generated by the remittances and return of its emigrants, very little quantitative evidence is actually available. In conclusion, a broad comparison of the characteristics of the Portuguese emigrants with those of other European countries illustrates that Portuguese emigration possessed some unique features. First, emigrants were predominately male until relatively recently. Second, in the nineteenth century, a large proportion of these male emigrants were young, often less than 14 years old. Third, the proportion of emigrants departing individually was decreasing in Portugal, while it was increasing throughout most of Europe. Finally, while the extent of return migration increased elsewhere, in Portugal it decreased.

Finally, in Section 2.8, the survey of the literature presented in this Chapter is summarised.

2.2 The Study of Migration

In the broadest terms, the characteristics of the three demographic phenomena - fertility, migration, and mortality - are reflected in their respective literatures. The simplest is mortality, which might be desribed as being a largely involuntary transition that each and every individual undergoes once and only once. Mortality is typically subjected to only the most quantitative of analyses. Fertility, historically also largely uncontrolled, provides demographers with a physical event, and thereby a sound basis on which quantitative analyses incorporating the effects of contemporary sociological issues are built. Finally, the most complex is migration[4], which cannot be identified by any physical change in humans, and so is more difficult to identify, quantify, and qualify. It is only too often described as a structural phenomenon, with little attempt being made to carry out a thorough quantitative and qualitative analysis.

This Section examines the problems arising in the study of migration, reviewing past and present theories and models of migration, and current approaches to the study of historical migration flows for which no mobility statistics are actually available.

Before examining theories and models of migration however, the essential features of such movements are reviewed. An individual (or household), having accumulated a set of information on his expected circumstances if a move is made (whether temporary or permanent), and having considered the associated advantages and disadvantages along some set of criteria (for example, a rise in socioeconomic status, at the expense of severance of kinship and social bonds), decides that a move ought to be to his advantage. His departure will have some effects on the sending society; his subsequent arrival at his destination will have some effects on the receiving society. The difficulty in quantifying these individual and household strategies arises because they are not physical attributes. Everyone has their own sets of criteria as to what constitutes adequate quantitative and

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[4]Here, only voluntary movements are considered to constitute migration.

qualitative information, and which circumstances might be advantageous or disadvantageous.

2.2.1 Theories and Models of Migration

Theories and models of migration can be broadly classified into those which attempt to account for the origins and forms of the migration process - causal theories, and those which seek to explain the various effects of migration - impact theories. Further, these theories have been formulated at three levels: that of the individual, the household, and larger, more anonymous groups. Finally, migration theories also fall into one of the following two categories: those which have been developed quantitatively, and those which have not.

In the literature, migration theories are also strictly divided into those which are described as equilibrium models, and those which are said to assume a historical-structural perspective. On the one hand, equilibrium models are described as those which interpret migration as the result of tensions between Old and New Worlds. They also seek to relate the level of migration to the characteristics of the sending society, the receiving society, or both. On the other hand, the historical-structural perspective is said to stress that population movement can only be examined in the context of historical analysis of the broader structural transformations underway in a particular social formation; it relies on the broader theory of socioeconomic and political change of which it is a part (Wood, 1982). However, if the features of migratory movement are re-examined closely, it emerges that the conditions on which the historical-structural perspective focuses must, in one way or another, produce a tension of the type incorporated in equilibrium models.

With respect to European emigration, impact theories broadly dominated the literature before 1960. These concern themselves with the settlement and assimilation of immigrants in overseas countries, and the rigours of the passage from Europe. In 1960, Thistlethwaite urged that mass migration ought to be examined in its broad social and economic context, arguing that the nature of emigration could not be revealed except through studies of its relationship with the

industrial and demographic revolutions (Runblom, 1976a:14). Thereafter, research has focused more on causal theories. These theories subject the relationship between annual rates of emigration and the characteristics of the sending and receiving societies to formal econometric analysis. More importantly they scrutinise the local background, and the social and economic structure of particular groups of emigrants (Baines, 1985: 1-2).

2.2.1.1 Models of Group Migration

At the aggregate level, Ravenstein's "laws of migration" (1885; 1889) are commonly cited as the earliest attempt to formulate an analytical framework for migration. However, his bold choice of title was somewhat unfortunate in that, by describing what were in fact characteristics (of British nineteenth century internal migration), as laws, his critics focused more on the misnomer than on the important results of his research. Nevertheless, his hypotheses have been used as the basis for a contemporary analytical framework of migration (Lee, 1966), while his contribution to the study of British nineteenth century internal migration has not yet been superseded (Grigg, 1977:54). The main criticism of this and other similar approaches to the understanding of migration remains however, they are essentially descriptive, lacking any truly theoretical grounding (Woods, 1982:142).

Models of group migration which have been theoretically formulated are generally of the equilibrium type. The most direct applications of the tension type of theory are the gravity models, popularised by Stewart (1948), reviewed by Carrothers (1956) and Olsson (1965)[5], and applied, amongst others, by Gale (1973), and

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[5]Cited by Flowerdew & Aitkin (1982:192).

Flowerdew & Aitkin (1982). These are of the form:

$$F_{ij} = k \frac{P_i P_j}{D^2_{ij}} \qquad (2.2.1)$$

where F_{ij} = the force of interaction between i and j,

P_i and P_j = the populations of i and j,

D_{ij} = the distance between i and j,

k = a constant.

The development and quantification of models by neo-classical economists has resulted in human capital models of the form developed by Schultz (1961; 1962; 1974) and Sjaastad (1962)[6]:

$$M_{ij} = f \left| \frac{I_j - I_i}{rd_i} - C_{ij} \right| \qquad (2.2.2)$$

where M_{ij} = the level of migration from i to j[7],

I_i and I_j = the average real incomes in places i and j,

rd_i = the rate of discount applied to future incomes in i,

C_{ij} = the costs of migration from i to j,

including opportunity costs.

Laber & Chase (1971) combine these two models, arguing that C_{ij} in (2.2.2) is a positive function of D_{ij} in (2.2.1), thereby deriving, in linear regression terms[8]:

$$M_{ij} = \alpha + \beta \frac{I_j - I_i}{rd_i} - f(D_{ij}) \qquad (2.2.3)$$

Many modifications to this basic model have been incorporated by various authors. Todaro (1976; 1980) introduces the critical concept of expectation by, for example, making an adjustment for the probability of finding employment at destination. Other variables

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[6] Cited by Woods (1982:144).

[7] Calculation of a measure of the level of of migration - usually expressed as a rate - has itself been the subject of discussion (see Haenszel, 1967).

[8] Cited by Woods (1982:145).

included in such multiple regression models include: level of education, level of employment, level of welfare payments, distance measured in terms of cost or time, etc.

One development however, is particularly worth mentioning - structural-equation models of the type estimated by Cadwallader (1985) in his study of migration in the Upper Midwest U.S.A. The model he estimates is illustrated in the following diagram:
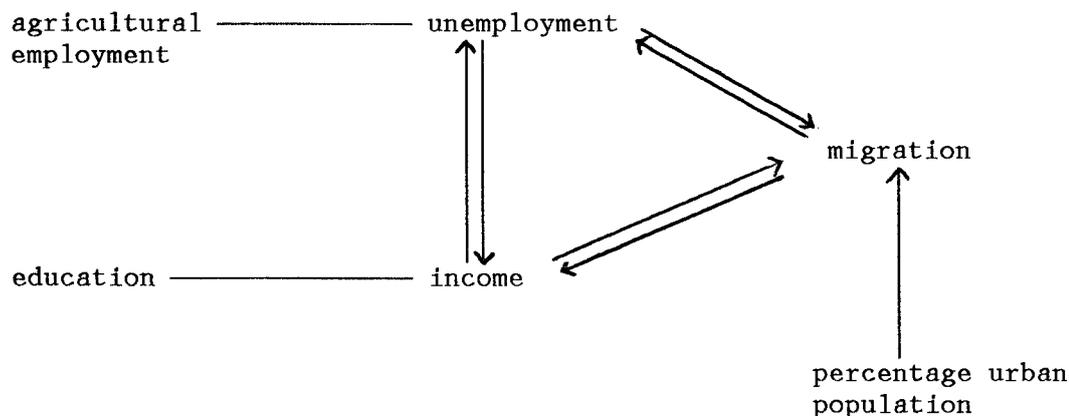
As can be seen, this causal model explicitly allows for the estimation of recursive relationships, such as the important interaction between income and unemployment[9]. The concept is important in that migration has been shown to be both a cause as well as a consequence of the economic well-being of a region[10].

Examples of studies conducted within the equilibrium framework include: migrant labour in nineteenth century British agriculture (Collins, 1976); migration out of agriculture in the U.S.A. (Hathaway, 1960); contemporary intra-European labour migration (Castles & Kosack, 1973a; b)[11]; and, of course, the great European emigration of the nineteenth and twentieth centuries (Kelley, 1965; Wilkinson, 1967; 1970; Moe, 1970a; 1970b; Gallaway & Vedder, 1971; Quigley, 1972; Richardson, 1972)[12].

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[9]For example, Cadwallader (1985) finds that while income levels affect the level of unemployment, the latter does not affect the former.

[10]See Thomas (1972) on the Atlantic economy; Thornton (1985) on migration within North America.

[11]Cited by Woods (1982:143).

[12]Econometric studies of emigration from Europe are reviewed by Gould (1979).

There are, however, two important drawbacks in the types of
model hitherto discussed. First, while in theory the dependent
variable is migration potential, in practise the level of migration
observed is used as a proxy; in reality, the inclination frequently
exceeds the level of actual movement, and the two are not related in
any simple way (Tetzchner, 1974)[13]. Second, they implicitly assume
that populations are homogeneous in their propensity to migrate. The
latter problem was investigated by Blumen et al (1955) in their
classic paper on industrial labour mobility. They found that some
people were more likely to be mobile than others, and suggested that
the population be partitioned into "movers" and "stayers". The same
phenomenon was in due course also identified in geographical mobility
studies (Tarver & Gurley, 1965; Rogers, 1966). This problem extends
to the fact that migrants are neither representative of their origin
nor destination societies, has been described as "the selective
nature of the migration process" (White & Woods, 1982:12-18).

Mobility in heterogeneous populations is usually modelled as a
Markov process[14] (e.g. Spilerman, 1972; Singer & Spilerman, 1974),
where, essentially, the leading diagonal of the relevant matrix of
transition probabilities is modified to incorporate the inertia of
the stayers. However, using such models, studies of residential
mobility within urban areas have identified that most migration data
of this type violate the three basic assumptions regarding the
observed transition probabilities. First, they do not remain
constant over time (nonstationarity). Second, the population is not
homogeneous with respect to the probabilities (inhomogeneity).
Third, the probabilities are not independent of the past migrant
history of an individual (duration of stay effects) (Clark & Huff,
1977; Clark et al, 1979). Pickles et al (1982) and Davies et al
(1982) develop a family of hypothesis tests specifically designed to
detect the presence of these effects.

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[13]This phenomenon has been demonstrated in recent Dutch interview studies (Ellemers, 1964)
(cited by Akerman, 1976:43).

[14]A Markov process is described by DeGroot (1985:73) as follows: At any given time n, when
the current state X_n and all previous states $X_1,...,X_{n-1}$ of the process are known, the
probabilities of all future states X_j (j>n) depend only on the current state X_n and do not depend
on the earlier states $X_1,...,X_{n-1}$.

The importance of kinship as an explanatory variable in the mover/stayer dichotomy has led anthropologists in particular to discuss this interpretation of migration in detail. For example, Johnston (1971) identifies members of the community of Nidderdale in the West Riding of Yorkshire with common surnames as being less mobile than others, thereby associating the mover with smaller kinship networks. The details of this selection process however, have been the subject of particularly heated discussion. Kasdan (1965), examining the entrepreneurship of many Basque immigrants in Antioquia, Columbia, compares the strict following of primogeniture in some Basque inheritance patterns with the delayed choice of heir in Irish and Norwegian societies, arguing that child-rearing is sometimes the key to the mover; often those who have been identified from birth as non-heirs are raised with a view to their inevitable out-migration. Douglas (1971) however, comparing two Spanish Basque villages, explains the higher rate of out-migration from that in which primogeniture was not practised, as being a result of competition among siblings to migrate rather than become the family heir. The ensuing debate between Brandes (1973), Douglas (1973a), Kasdan & Brandes (1973), and Douglas (1973b), is very illuminating, though somewhat open-ended.

In conclusion, where aggregate migration has been quantified, fairly sophisticated models with reasonable explanatory power have been developed to investigate the phenomenon.

2.2.1.2 Models of Individual (or Household) Migration

As mentioned earlier, the alternative to these group models of migration are those formulated at the level of the individual (or household), which focus more closely on the features of migratory movements. This - the behavioural approach - focuses on the way in which an individual forms a set of attitudes which are then translated into action.

It is formalised by Wolpert (1965), who introduces the important concept of a place utility matrix U consisting of elements U_{nm} which give the utility of place n on characteristic m; the place utility matrix is multiplied by a vector of weights ascribed to the values of the characteristics by a particular individual, yielding a weighted

place utility matrix W in which the sums of the columns give the scores for each place[15]. "In the hands of economic man the place utility matrix is a very precise decision making instrument" (Woods, 1982:135). In general however, it must be assumed that individuals behave in at least a "selectively rational manner" (Leibenstein, 1976; 1978). Even then, the reactions of different individuals to the same information may introduce heterogeneity such as that incorporated in the catch-all "ability to use" classification of Pred's (1967; 1969) behavioural matrix. Further, the behavioural approach considers the availability of information - "perhaps the most important factor in the decision to emigrate" (Baines, 1985:23) of the nineteenth and early twentieth century. Examples of work on this aspect include: the review presented by Gould & White (1974), which clearly shows the influence of distance on perception; Hägerstrand's (1967) classic work on innovation diffusion at the local level; and research on the chain migration process of European mass emigration (Hvidt, 1975:183-194; Conrad, 1980)[16].

Finally, where household sustenance strategies dominate migration decisions, neither the group nor the individual approach accurately reflect the process (Wood, 1982); for example, Friedl (1974), having performed a study of migration from the rural village of Vasilika to Athens between 1930 and 1960 with the individual as the unit of analysis, finds that the most important variable with respect to migration and its outcome was the level of the family household's economic resources. In the past, households were often faced with a choice between the permanent migration of the whole family, and the temporary migration of one or more of its members, who would remit funds for the rest of the family. Where the whole family migrated, a complete reorganisation of the family economy was sometimes necessary, as in the case of nineteenth century Irish emigration to England (Lees, 1976). Where only one or more members went temporarily, effects usually manifested themselves more subtly. The choice of one or other of these strategies is associated with what might loosely be termed the ideology of migration; in societies

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[15]Described by Woods (1982:135).

[16]Cited by Woods (1982:137).

where an ideology of return migration was fostered, there was often a strong tendency for individuals to go singly.

2.2.2 The Identification of Migration

The preceding discussion of theories and models of migration presupposes that movements have been identified, and classified along some criteria. However, with respect to historical demography, this supposition is rarely justified, and the researcher is often forced to resort to quite ingenious techniques in order to identify migration and its components, and thereby to enable theories of migration to be examined. With respect to the identification of migration, evidence can be classified according to whether it is direct, indirect or inferential; these three types of evidence are reviewed in the following subsections.

2.2.2.1 Direct Evidence of Migration

Although records of population movements were sometimes compiled in the past, they tended to refer to movements that were controlled in some way, such as the Settlement Certificates dating mainly from eighteenth century England (Hollingsworth, 1970). Very few historical societies recorded voluntary population movements directly[17], although some sources - such as the lists of passengers travelling on ships bound for the New World - were compiled with little governmental interference. This lack of direct evidence for migration has led to the use of indirect and, more recently, even inferential evidence for migration.

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[17]The Tokugawa regime of Japan, which began in 1600, initiated migration registers called zōgenchō, although Samurai and some other groups remained entirely outside the population registration system (Smith, 1977). In Sweden, the Church Law of 1686 called for the recording of in-migration and out-migration in special books; these migration registers were not kept on a regular basis, however, until the early nineteenth century (Tedebrand, 1972a).

2.2.2.2 Indirect Evidence of Migration

Indirect evidence for migration is usually in abundance, ranging from tickets or passports issued, which provide evidence of future movement[18]; to the enormous number of documents on which birthplace or some other place of previous residence was recorded, which provide evidence of movement to the place in which the particular document was compiled.

Sabean (1970) uses place of origin information on the Family Registers from Württemberg, Germany, to examine geographical mobility during the period 1760-1900. Schofield (1970) uses the exceptional Cardington (Bedfordshire) listing of inhabitants compiled in 1782 to examine age-specific mobility to and from that parish in detail[19]. Langholm (1975) uses similar information available from the original Norwegian population census lists of 1865, to investigate short-distance migration to and from Ullensaker. Court Depositions are used by Clark (1979), who analyses the biographical data (usually including birthplace, current place of residence, etc.) of over 7,000 witnesses appearing in diocesan courts in southern and midland England between 1660 and 1730 - a non-random sample of about 1% of the population. These have also been used extensively by Souden (1981).

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[18] Of course, sometimes tickets and the like, issued for some journey, were not actually used.

[19] The Cardington listing of inhabitants, described in detail by Tranter (1967), is exceptional because it provides a wealth of information, including information on both movement into and out of the parish, that has hitherto not been found in other English listings of inhabitants.

2.2.2.3 Inferential Evidence of Migration

Inferential evidence for migration does not require that the movement of a particular individual is explicitly recorded. It can best be introduced with the pioneering work of Higounet (1943). At the time surnames were introduced in Europe many of the names were place-names, suggesting that any list (from that time) of the names of the inhabitants of a particular place will provide information on gross inward migration[20].

However, the applicability of this method is clearly limited. Of far greater interest is inferential evidence for migration based singularly on the assumption that if in individual does not appear on a particular document pertaining to a particular place, then either he was not eligible to do so, or he did not do so because he was not there. For example, from two lists of inhabitants, compiled at different dates, migration can be inferred from the exclusion of an individual from one or other of the lists (Buckatzch, 1951; Cornwall, 1967). The application of this method is not straightforward however, since it requires that the two lists be linked such that the number of individuals who did indeed appear on both lists - true links - is maximised, while the number of cases in which different individuals with the same names or other characteristics or both are linked - false links - is minimised. The methodology of record linkage is discussed in detail in Section 4.4, but here attention is restricted to the study of migration, bearing in mind that results may be heavily dependent on the accuracy of the record linkage process. Buckatzch (1951:65) reports analyses of English parish registers which simply monitor the occurrence of each surname during the sixteenth, seventeenth, and eighteenth centuries; the in-migration or out-migration of families is inferred from the appearance and disappearance of their surnames on the registers. Pouyez et al (1981) use this method on a large scale, comparing the Quebec censuses of 1852 and 1861, in order to examine migration[21]. This method has also been applied to modern data; Johnston (1971)

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[20]Cited by Hollingsworth (1970:89).

[21]Cited by Gauvreau (1986:8).

compares the electoral registers of 1951 and 1961 in the West Riding of Yorkshire.

The technique is ambitiously extended to the analysis of parish registers by Souden (1981). Examining reconstituted parish populations from the mid-sixteenth to the mid-nineteenth century, he focuses on couples for which a marriage record (Mar) exists, classifying the man and wife according to whether they were also baptised (Bap), or buried (Bur), or both baptised and buried in the parish. In this way, he distinguishes between the following four combinations of events:

No other events: ——/——

One other event: Bap/——   or   ——/Bur

Two other events: Bap/Bur

This classification enables him to differentiate between movers (——/——, ——/Bur, Bap/——) and stayers (Bap/Bur), in-migrants (——/Bur, ——/——) and out-migrants (Bap/——, ——/——), etc. This innovative analysis is complicated however, by the need to take into account various technical factors which (at least in England) might considerably affect the results. Snell (1984) succinctly lists the laxity of registration; the common practise of mothers to deliver a child (particularly the first) in the mother's father's parish; the tradition of marriages taking place in the wife's father's parish; the insistence of some people on their place of burial; the possibility that parishes might expel elderly people under the Poor Law, in order to avoid the not insubstantial costs of burial; and several other acts and laws which could affect the results[22]. Further, non-technical problems, such as the non-random nature of the sample of the population (for example, common law marriages are omitted), possibly introducing some selection bias, must also be taken into account. Nevertheless, Souden (1984) reaffirms his belief that the technique provides a reliable enough picture of mobility. Gauvreau (1986) is using the same approach in her study of migration

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[22]The significant extent to which people were sometimes buried in parishes other than those in which they had been normally resident prior to death is illustrated by Schofield (1984), who reports that of the 226 burials in Barming, Kent, in the period 1788-1812, 15 were of non-residents, and 64 were of imported corpses.

in the reconstituted population of the Quebec province; however, since she does not compare her own work with that of Souden, it is difficult to ascertain whether any of the aforementioned difficulties apply there, and if so, to what extent.

Finally, Wrigley and Schofield's (1981) use of aggregated baptism and burial statistics to infer demographic change, including the estimation of net historical migration flows, requires some attention. The methods developed stem from those of inverse projection, pioneered by Lee (1974). Standard population projections essentially consist of the estimation of the number of future births and deaths in a population for which operative fertility and mortality schedules are assumed to be known; inverse projection involves the inference of a fertility and mortality schedule from a series of birth and death data. However, inverse projection methods suffer two major limitations: they only produce accurate results when applied to closed populations, or those where net migration is negligible; and, they also require the demographic structure of the population at the beginning of the period to be known. These limitations are overcome with the application of the aggregative back projection technique, which "reconstructs the size and age structure of past populations from a knowledge of the totals of births and deaths stretching back from a reliable census" (Oeppen, 1981:715). Aggregative back projection produces quinquennial net migration totals and annual migration rates in each quinquennium, subject to two major reservations. First, the estimates do not measure what is normally understood by net migration, since they arise as the difference between the estimated and observed birth cohorts. Second, the timing of migration cannot be captured accurately, since a fixed age schedule of migration is imposed. Despite these limitations, the technique does produce figures which enable Wrigley & Schofield (1981:228) to identify periods when "the balance of net migration influenced national population trends ... [though] ... changes in fertility and mortality played a much larger part in determining rates of population growth". In fact, the estimates of the aggregative back projection technique adopted by Wrigley & Schofield are dependent on the schedule of migration chosen (a different schedule of migration produces a different solution), leading Oeppen (1985) to suggest the adoption of an optimisation algorithm designed to minimise the variation of migratory movements. With respect to

the original algorithm, criticism has been directed toward its vulnerability to convergence effects (Lee, 1983; Wachter, 1986), and the stability of the estimates produced (Blum & Bonneuil, 1986).

2.2.2.4 The Components of Migration

Whichever source of evidence for migration is used, once a movement has been identified, it must be carefully classified for the purposes of analysis, and to ensure the comparability of results from different studies.

Considering the example of an urban centre, any movement to, within, or from that centre, must fall into one, and only one, of the following categories: in-migration, intra-urban migration, or out-migration. These components can be further subdivided so that in-migration is composed of non-native in-migration and native in-migration (which must be return migration); and out-migration is composed of national out-migration and international out-migration (emigration). In this way, the components can be used in conjunction with other aggregate demographic statistics to trace the population dynamics of the urban centre over time.

Further, other classifications of moves can be adopted, describing them along such as temporary or permanent, short or long distance, and rural to urban. However, these require the definition of other metrics. For example, in this study, distance of migration is classified in terms of administrative divisions: within parish, and between parish, borough, district, province, country, and continent; in this case, the definitions do not coincide with more natural boundaries.

The importance of the classification of movements is illustrated by the study of Kau & Sirmans (1976), who perform a multivariate regression analysis consisting of six equations of new, repeat, and return migration, each for the white and black population separately. They find evidence of considerable bias in earlier results from regression analyses which did not differentiate between the different races and components of migration.

With respect to historical migration flows, Tilly (1977) places emphasis on four types of migration, while acknowledging that they overlap: movement within the labour, land, or marriage market - local

migration; movement which takes a social unit to a destination through circumstances which return it to its origin after a well defined interval - circular migration; movement directly or indirectly affected by information or encouragement from previous migrants - chain migration; and movement designed to secure a different (better) position within some defined structure - career migration.

2.2.3 Summary

In conclusion, attention is drawn back to the opening observations of this Section. There is little doubt that the decision to migrate is made at the individual, or in some cases household level. It is a function of the perceived advantages and disadvantages of alternative destinations in comparison with those of the current place of residence.

Unfortunately, continuous flows of emigration from some areas have tempted researchers to adopt a historical-structural perspective, describing the societies of those areas as "migration orientated" (e.g. Philpott, 1968:466)[23]. Another relevant example is the study of Portuguese emigration for example, which began in the sixteenth century, leads Serrão (1974) to conclude that emigration is a structural phenomenon of the country's society. This tends to leave major questions unanswered however, such as, what particular characteristics of the society result in the continuous flow of emigrants?

The problems peculiar to the study of migration as a demographic phenomenon arise because these perceived advantages and disadvantages are supplied by a person's highly individual information network, and are subject to his own highly individual interpretation. These problems are therefore difficulties of measurement, or quantification. The study of migration has broadly been governed by the data available, which, particularly sparse at the individual level, have resulted in little quantification of individual, or

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[23]Philpott uses the term "migration-orientated society" to describe that of Monserrat, in the Eastern Caribbean (cited by Philpott, 1970).

behavioural models of emigration. At the aggregate level, where individual differences are lost amidst stochastic variation, attempts to fit explanatory models have produced some worthwhile results.

Finally, with respect to historical migration flows, the discussion of theories and models of migration presupposes that movements have been identified, and classified along some criteria. This supposition is rarely justified however, and the researcher is often forced to resort to quite ingenious techniques in order to identify migration and its components, and thereby to enable theories of migration to be examined.

2.3 Emigration from Europe, 1815-1914

During the century between the end of the Napoleonic Wars and the outbreak of the First World War, it is estimated that between 44 and 52 million people emigrated from Europe[24]; in the last decades of this period the average number of people emigrating from Europe approached 1 million per year[25]. Estimates of the enormous migrant flows involved will always remain approximate however, since they consist of figures which were not always based on the same kind of data, and further, in some countries of emigration and immigration, information was simply not collected at the time[26]. Indeed, "it is astonishing to realise that the great system builders of the nineteenth century have shown so little interest in the migrational phenomenon" (Åkerman, 1976:20).

Where migrant numbers are available for some population of interest, two fundamentally different analyses can be performed. First, the number of migrants in a particular period can be compared to the total number of people in that population, thus enabling the incidence of migration from the population to be assessed; for example, this procedure can be used to compare rates of emigration from different countries. Second, the number of migrants can be compared to the total number of migrants from some larger population of which the population of interest forms a part, thus indicating the importance of the contribution of migrants from the population of interest; this procedure can be used when examining the various origins of immigrants to a particular country for example. Unfortunately, there has sometimes been a tendency toward using the latter procedure in answering questions that require the application

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[24] The statistics compiled by Ferenczi & Willcox (1929:235-288) record that 44 million emigrants left European countries for overseas destinations between 1816 and 1915, and 52 million were reported to have arrived (cited by Baines, 1985:1).

[25] The number of people who migrated from Europe overseas averaged 911,000 per year during the period 1891-1920 (U.N., 1953:100; cited by Cipolla, 1978:119).

[26] For example, while about one-fifth of all European emigrants in the hundred years following the Napoleonic Wars were British, this quantitative importance is not reflected in the literature because relatively little data were being collected (the British Government simply reported passenger departures in certain kinds of ships), and those which were were often seriously deficient (Baines, 1985:2-3).

of the former, thereby generating serious misconceptions. Bearing this in mind, since this Section is principally concerned with the emigrations from Europe, only data which relate the number of emigrants to the size of the population from which they were drawn will be presented.

Perhaps the first cross-national comparison of European emigration rates was that of Sundbärg (1910), but in order to include estimates of rates right up to the onset of the First World War, a more recent set of figures, based on the monumental work of Ferenczi & Willcox (1929; 1931), has been used. Table 2.1 shows net annual average migration from Europe between 1851 to 1913 in the form of rates per 1,000 inhabitants.

Table 2.1 Overseas Emigration (Outward Sailings) by Citizens of European Countries, 1851-1913 (mean annual rate ‰)

Country	1851 1860	1861 1870	1871 1880	1881 1890	1891 1900	1901 1910	1913
Ireland	14.0	14.6	6.6	14.2	8.9	7.0	6.8
Norway	2.4	5.8	4.7	9.5	4.5	8.3	4.2
Scotland	5.0	4.6	4.7	7.1	4.4	9.9	14.4
Italy	-	-	1.1	3.4	5.0	10.8	16.3
England and Wales	2.6	2.8	4.0	5.6	3.6	5.5	7.6
Sweden	0.5	3.1	2.4	7.0	4.1	4.2	3.1
Portugal	-	1.9	2.9	3.8	5.1	5.7	13.0
Spain	-	-	-	3.6	4.4	5.7	10.5
Denmark	-	-	2.1	3.9	2.2	2.8	3.2
Finland	-	-	-	1.3	2.3	5.5	6.4
Austria-Hungary	-	-	0.3	1.1	1.6	4.8	6.1
Switzerland	-	-	1.3	3.2	1.4	1.4	1.7
Germany	-	-	1.5	2.9	1.0	0.5	0.4
Netherlands	0.5	0.6	0.5	1.2	0.5	0.5	0.4
Belgium	-	-	-	0.9	0.4	0.6	1.0
France	0.1	0.2	0.2	0.3	0.1	0.1	0.2

Source: Baines (1985:10); adapted from Ferenczi & Willcox (1929:200). 75% of emigrants from English ports 1851-2 are assumed to be Irish (see Baines, 1985:49). The rank order is the mean emigration rate of the four heaviest decades.

The figures show that the large scale emigrations originated in north-western Europe, and spread southward and eastward. However, while Swedish and German emigration had passed their peaks by the 1880s, Norwegian and British emigration only peaked during the first decade of the twentieth century. In contrast, emigration from southern and eastern Europe only began to rise sharply during the last quarter of the nineteenth century, and continued well into the

twentieth. The development of emigration from an individual country, and from Europe as a whole, is seen by Scandinavian historians as comprising an introductory, growth, saturation, and regression phase, together with some self-generating effects and local short-term factors (Åkerman, 1976:27-28); though this view is certainly consistent with the Swedish emigration considered by Åkerman, it is less useful in the case of Ireland, for example, where the level of migration was consistently associated with the short-term success or failure of the potato crop (Johnson, 1913:52-53).

The vast majority of these emigrants settled in the United States of America; one estimate suggests that of 38.5 million people (gross) entering the U.S.A. between 1801 and 1935, 34 million were European. The main destinations are set out in Table 2.2, together with estimates of the number of people received in their main periods of immigration.

Table 2.2 Major Destinations of Emigrants from Europe

Country	Period	Estimated Immigrants
U.S.A.	1801-1935	34,000,000
Argentina	1857-1940	7,000,000
Brazil	1821-1945	5,000,000
Africa	1835-1935	5,000,000
Canada	1821-1924	4,500,000
Australia	1788-1934	1,300,000

Source: Erickson (1976:12-13)

The causes, characteristics, and effects of these major population movements were extremely complex and varied enormously; Erickson (1976:15) carefully concludes that "what one can say with some confidence, though little precision, is that emigration rose in rural societies changing as a result of commercial opportunities in agriculture associated with the growth of cities and industry, whether nearby or in other parts of the Continent or Britain in touch through trade". In fact, somewhat paradoxically, while the expansion of the European economy generated emigration, the transfers of population have themselves been found to have been a major condition for growth in the nineteenth century (Thomas, 1958). In the broadest terms, the expansion of the European economy, through enormous technological achievements, brought with it a drastic reorganisation of employment patterns from those in which rural workers were legally

bound to the land to those of a free labour market. At the same time, those no longer required in agriculture and the newly-revolutionised industries, who were increasingly taking refuge in the growing urban centres of their own country, were being attracted by the New World. Nevertheless, emigration was not related in any simple way to rural poverty or population density, and although it is fairly accepted that economic factors were predominant, "statistical demonstrations that the pull of overseas lands was greater than the push from Europe fall short of explaining the great migration" (Erickson, 1976:11)[27].

In any case, most of the characteristics of the emigrations changed over time. While initially the movement had been largely the spontaneous emigration of families and individuals (though sometimes aided by the state), later phases of the movement were more susceptible to the pull and push factors considered in formal econometric analyses[28]. At the same time, the predominance of family groups among the emigrants was gradually reduced by the increasing proportion of individuals. Also, the later phases saw the chief immediate-origins of emigrants shift from rural to urban centres - though some of these emigrants may have left the countryside some years earlier (Erickson, 1976)[29].

Formal econometric analyses of the push and pull factors of the emigrations are reviewed by Gould (1979) and, most recently by Baines (1985:17-23). They include the work of: Jerome (1926), who first

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[27] For example, Gallaway & Vedder (1971), analysing emigration from the United Kingdom to the United States, 1860-1913, find that the level of emigration was influenced more by pull factors than push factors; although the single most important variable was unemployment in the sending country.

[28] For example, the initial increase in emigration from Germany (1830-1845) is attributed to the spread of the Auswanderung (migration) idea rather than to an increase in the intensity of emigration, while the later emigration explosion of the mid-1840s was the direct result of the potato rot and resultant extreme poverty, and the fluctuations of the 1860s and 1870s were due to the effects of the American and German Civil Wars (Walker, 1964:42).

[29] Erickson (1981:176) notes the studies of Nillson (1970), and Köllman & Marschalk (1973), which find that late nineteenth century urban emigrants (from Scandinavia and Germany, respectively) had often left the countryside some years earlier. Most recently, Baines (1985) finds that people who had been born in the rural counties of England and Wales were, on average, only marginally more likely to emigrate than natives of the urban counties, and that there was no general trade-off between rural-urban migration and emigration; this last point however, is in sharp contrast with Swedish emigration experience (Carlsson, 1976:134).

showed the extent to which immigration to the U.S.A. was positively correlated with the American business cycle; Thomas (1954; 1972), who uses the explanatory device of the long swing in the Atlantic economy; and Easterlin (1961) and Tomaske (1971), who perform cross-sectional studies. The most popular approach however, is the use of time series analysis by Kelley (1965), Wilkinson (1967; 1970), Moe (1970a; b), Gallaway & Vedder (1971), Quigley (1972), and Richardson (1972)[30]. Perhaps the most sophisticated and interesting of these is Moe's work on Norwegian emigration to the United States; he explains about 87% of the observed variation in the emigration rate of young adults, using the following explanatory variables: previous income differential, the pool of persons in the mobile age groups in Norway, the pool of previous emigrants in the U.S.A., transport costs, and differential employment opportunities - as measured by an estimate of unemployment. The comparison of these types of studies, however, is fraught with difficulties: the dependent variable - the level of emigration - is critically dependent on the definition and measurement of emigration at the time, the estimation procedure is vulnerable to the obvious point that a trend in the level of emigration is bound to be highly correlated with a similar trend in any independent variable, and there is no agreement about the relevant independent variables. Also, since there is more likely to be variation in data about several countries than in data about one country, it is worth mentioning Neal's (1976:262) claim that if a model considers many sending countries and one receiving country, the use of non-parametric techniques will show pull influences to be dominant (e.g. Easterlin, 1961) and parametric analyses will show push influences to be dominant (e.g. Wilkinson, 1967); the opposite is true if the study is one of one sending country and many receiving countries. In conclusion, Baines (1985:23) observes that the most consistently successful variable is the level of previous

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[30]The methodologies and the data used in econometric studies of European emigration are critically reviewed by Poulson & Holyfield (1974); Williamson (1974a; 1974b); Neal (1976); Pope (1976); and Gould (1979) (cited by Baines, 1985:19).

emigration[31], which may be because the most important factor in the decision to emigrate was the flow of information; he suggests that "the greatest chance of increasing the understanding of European emigration is probably through the detailed (quantitative) analysis of local migration flows".

Indeed, the importance of the flow of information redirects attention to what Erickson (1976:9) highlights as a remarkable feature of the emigrations: that "the planning and migrating unit consisted primarily of individuals and families". Since the emigrations were of this atomistic nature, it is necessary to consider that important individual-level decisions were made from often very limited sets of information - those which were immediately available[32]. Thus, the perceived advantages of emigration compared with those of staying, bearing in mind the expense of choosing the former alternative[33], might be formulated from highly biased, or at least subjective sources such as advertisements in the media, or the impressions of previous migrants. Perhaps the more important of these two sources is the latter, which generated what is known as chain migration.

Chain migration, more than any other single factor, can simultaneously account for homogeneity in the levels of emigration from some regions, and the considerable variance in those between individual towns and villages of others (Baines, 1985:26). Being dependent on the flow of information however, chain migration theories have proved very difficult to quantify. A noteworthy example of a study which allows the extent of chain migration to be gauged is Ostergren's (1972) examination of the membership records of the Augustina Lutheran Church to which most of the Swedes in his Minnesota study area belonged. His work, involving a fairly complete reconstruction of birth fields in Sweden for a number of American

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[31] This is particularly the case in the sophisticated multivariate analyses of Norman (1974; 1976), which focus on push-factor causes of emigration from Sweden.

[32] With respect to emigrants from England and Wales in the last 40 years of the nineteenth century however, Baines (1985) concludes that virtually all had made a rational choice which was based on a considerable amount of information.

[33] The introduction of the steamship greatly facilitated emigration - not least because it reduced the number of weeks during which an individual had to forego earnings.

congregations, identifies some receiving areas in which the vast majority of Swedish immigrants had emigrated from a birth field of relatively limited radius.

Returning to emigrant characteristics however, Erickson (1981:196) describes commonly stated hypotheses that it was mostly the very poor who left, as an "agrarian myth". In her study of lists of passengers travelling between the British Isles and the U.S.A. in 1831 she reports the astonishing degree to which movements were of lower middle class family units, with emigrants of all ages except the very old, and the predominance of people with means, often from commercial and professional backgrounds. In the same vein, she finds that neither unemployed industrial workers nor displaced farm labourers were over-represented in the passenger lists of 1885-1888, while building trade workers, miners, and unskilled workers were, to a great degree. Thus, the fact that the very poor were not emigrating allows her to conclude (1981:196) that "emigration did not help where it was most needed". Similarly, Cousens (1960) studying emigration from Ireland during the great famine, 1846-1851, finds that emigration was not confined to the poorest classes, but that it took a great many from among the more able in the community.

On the other hand, considering parts of Mediterranean Europe, Mondschean (1986), studying the emigrations from Italy during the early twentieth century, finds that illiterate Italians were more likely to emigrate than those who were literate, and the married were more likely to emigrate than the unmarried. He also identifies different age patterns of emigration between the sexes, such that women were more likely to go at older ages, probably to join their husbands who were already established in America. These comparable studies serve to demonstrate that the mass emigrations manifested themselves as quite different phenomena in different parts of Europe.

State attitudes to the emigrations varied enormously between different sending countries, and particularly between sending and receiving countries; further, they were extremely volatile, being closely associated with the predominant population theories of the period. Historically, mercantilist emigration policies had been dominant - a large and growing population was nearly always seen as a valuable provider of labour, military force, and as an indicator of the greatness of a country and its ruler (Kälvermark, 1976:95). Although overseas colonist settlements had been important in the race

to claim newly discovered lands, their size, and therefore power, were strictly controlled, thereby minimising their opportunity to demand autonomy. Two important developments of the late eighteenth and early nineteenth centuries were to change this attitude: the Malthusian overpopulation theories[34], and the growth of European liberalism. Emigration soon came to be viewed as a demographic regulator, relieving population pressures in the Old World of rural-agrarian societies (Woods, 1982:131); as such, it generated little interest or concern in the early nineteenth century (which goes some way in explaining the lack of recorded statistics).

However, the second half of the nineteenth century saw the refutation of these overpopulation theories; population growth once more came to be seen to benefit a nation, increasing its power, and, with the emigration to colonies, allowing any overflow to remain useful to the country (Overbeek, 1974:4-5). Somewhat paradoxically however, the receiving countries were at the same time beginning to worry about their ability, and indeed wish, to continue to absorb the seemingly infinite tide of immigrants.[35]

While European countries did begin to discourage emigration in the nineteenth century, the atmosphere of liberalism ensured that they rarely took steps towards its prohibition. In some countries it was indirectly controlled through the obligation to military service; in others however, direct inhibition was sometimes pursued by the government; a notable example is provided by the ordinances sent out from Darmstadt, Germany, in the 1820s to stamp out **Auswanderung** (migration) (Walker, 1964:40). In any case, as Halpern Pereira (1981:16) points out, the study of emigration has remained inseparable from that of the policies of immigration and emigration pursued by the countries involved.

Finally, not all emigrants established themselves permanently in the New World; many returned to their homes in Europe, either because of dissatisfaction and disillusionment, or because they had originally planned to do so; and some who returned to Europe later

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[34]Malthus first published his essay on the principle of population in 1798.

[35]See Stark (1967) for a detailed discussion of the economic factors governing the desirability of migration in terms of profits and losses of the emigration and immigration countries.

emigrated again. As the nineteenth century progressed, and travel time was sharply reduced with the increasing use of steam-travel, return migration and repeat migration became an increasingly important phenomenon throughout Europe; by 1900 it was probably common among all groups except perhaps the Irish and the Jews (Baines, 1985:28).

However, information on return migrants is even scarcer than on the original emigrants. Although gross figures of arrivals in Europe are sometimes available, they neither differentiate between permanent repatriates and those intending to come home only temporarily, nor between unsuccessful emigrants and successful return migrants; and they provide no indication of the characteristics of these travellers. Nevertheless, in so far as a gross rate is useful, by 1900, return migration was probably at least a third of emigration, and was increasing (Baines, 1985:28)[36]. With respect to England and Wales, Baines (1985) demonstrates that the rate of return rose sharply in the 1870s, which was the first decade in which virtually all emigrants on the North Atlantic were carried by steamships. Shorter-term oscillations about the general trend for Sweden have been found to be closely associated with fluctuations in American economic conditions (Tedebrand, 1972a:212), corroborating hypotheses of international migrant labour in a single Atlantic economy.

In contrast with the original emigration flows however, the levels and characteristics of return migration differed relatively little between the sending countries of northern and western Europe, and those of Mediterranean Europe. The notion that return was more common in the Mediterranean countries (e.g. Tedebrand, 1972b:201) appears to be based on traditional folklore such as the ideology of return migration discussed in the anthropological literature, and the quantitative evidence of more recent intra-European migrations. For example, there is no evidence to suggest that the 40-50% gross return rates reported by Baines (1985) for England and Wales in the late nineteenth and early twentieth centuries, or even the long-term average gross return rate of 19% reported by Tedebrand (1972b:209) for Sweden in the period 1881-1930, were significantly and consistently exceeded in Mediterranean Europe. At the same time, a

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[36]See Gould (1979:606-609) for the most recent assessment (cited by Baines, 1985:29).

significant proportion of return migration to most areas of Europe was back to the region, if not parish, of emigration. For example, around 40% of the total number of migrants who left a number of typically forested parishes in western Sweden during the period 1930-1944 returned to their parishes of out-migration (Wallander, 1948:140; cited by Tedebrand, 19762:203). There are exceptions however; for example, of the Greeks returning from the U.S.A., although some returned to their native rural villages, most settled in cities such as Athens, Saloniki, and Pireus (Saloutos, 1956; cited by Tedebrand, 1972b:203).

With respect to the duration of stay in the New World, perhaps the only quantitative figures hitherto available are those derived from the Swedish migration registers; Tedebrand (1972b:225) examines those of male principal persons who emigrated from Västernorrland and returned from North America in the period 1880-1913, finding that 30% (of 1,193) stayed for only one year, 17% for two, 14% for three, 11% for four, 23% for five to nine, and the other 5% for ten or more years. Considering the characteristics of the return migrants, (in Sweden) they were more likely to be significantly older than the original emigrants, and married; there is also some evidence that return rates were slightly higher in agriculture (Tedebrand, 1972b:217).

In summary, traditional theories of loss of land, over-population, industrialisation, and urbanisation have all fallen short in the explanation of trends in the level and characteristics of the emigrations from Europe during the century between the end of the Napoleonic Wars and the outbreak of the First World War (Baines, 1985:13-15); further, none of the theories account for the substantial levels of return migration witnessed throughout Europe. Econometric models of short-term fluctuations about the general trend have proved more successful, but many have been seriously flawed both in their use of data and in their methodology (Baines, 1985:20). However, the refutation of traditional theories, and the dissatisfaction with econometric models has promoted research into perhaps the most important and interesting issue of the emigration phenomenon - the flow of information. The most recent work has therefore focused on the detailed quantitative analysis of local migration flows, in the hope that this might provide a greater understanding of the European emigrations.

2.4 An Overview of Portuguese Emigration

Although the first Portuguese discoveries in the Atlantic date back to the early fifteenth century, the overseas expansion is only deemed to have begun in earnest almost a hundred years later, following the discovery of Vera Cruz - later to be renamed Brazil (Peres, 1960)[37]. The importance of colonist settlements in the race to claim newly discovered lands during the following centuries is emphasised by Serrão (1974:87), and is illustrated by the fact that by the time the Portuguese established their first colony in Brazil, in 1531, the French already had settlements in what were later to become Bahia, and Pernambuco (Telles, 1914).

The colonists, however, were soon joined by individuals whose primary interest was to acquire great wealth with minimum effort. Gold, having first been discovered in the interior of the Province of São Paulo, Brazil, in 1560, was responsible for the rush at the end of the seventeenth century during which about 2000 people per year were embarking in the ports of Viana, Porto, and Lisboa, bound for Bahia, Pernambuco, and Rio de Janeiro alone (Godinho, 1978).

Table 2.3 shows guesstimates of the total number of people who left mainland Portugal in each of four periods from 1500 to 1760[38].

Table 2.3 Portuguese Emigration, 1500-1760

Period	Number of emigrants
1500-1580	280,000
1580-1640	300,000
1640-1700	120,000
1700-1760	600,000

Source: Godinho (1978:9)

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[37]Although Brazil is generally thought to have been discovered in 1499 by Pinzon, who claimed it for Spain, or in 1500, by the expedition led by Pedro Alvares Cabral, which claimed it for Portugal, it has been suggested that its existence was already known to the Portuguese in 1494 when the Treaty of Tordesilhas - which divided the known world into two spheres of influence - was drawn up with the Spanish (Costa, 1965).

[38]Since no quantitative data are available for this period, it is likely that the guesstimates are derived from qualitative sources; however, Godinho does not make it clear.

Unfortunately, apart from the figure of 24,000 Portuguese who entered Rio de Janeiro between 1808 and 1817 (Telles, 1913:29), no systematically collected statistics of Portuguese emigration before 1855 are available; this is despite the fact that legislation passed in 1835 had provided that the particulars of all passports[39] issued for travel outside Portugal were to be recorded in passport books by the Civil Administration of each district[40]. The monumental work of Ferenczi & Willcox (1929) includes the total number of emigrants between 1855 and 1865, and the annual number thereafter. Since then however, extensive searches of the nineteenth century literature have uncovered additional information; it is for this reason that the annual numbers of emigrants during the period 1855-1873 compiled by Serrão (1974)[41] differ significantly from those of Ferenczi & Willcox. The demographic statistics of emigration now available include: from 1855, the total number of emigrants per year; from 1872, the division of these totals by sex and into two age groups (under 14 years, and 14 years and over); from 1941, six smaller age groups; and, from 1955, ages in five-year intervals. It is surprising that official statistics remained so crude for so long, when detailed information had been collected at the individual level since 1835.

Since no systematically collected statistics of Portuguese emigration before 1855 are available, there is a temptation to place

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[39]The first passports carried the name of the holder, his birthplace, marital status, and occupation, his destination, the name of the person declaring himself responsible for the application (this item was dropped during the 1850s), and a number of descriptive particulars concerning age, height, face, hair, eyebrows, eyes, nose, mouth, colour, and any other distinguishing features. In addition, the date of issue was recorded, together with the length of time for which the passport was valid (usually 60 days), and the signature of the official issuing the passport. Space was also provided for the recording of the intended travel itinerary (port of embarkation, etc.), but this was rarely used. This basic structure soon evolved to include the passport holder's current place of residence, his father's name, space for the inclusion of information regarding persons accompanying him. Much later, in 1927, passport photographs began to appear.

[40]The administrative reforms of 1835 created 17 districts of Portugal (an eighteenth, Setúbal, was created in 1926).

[41]Serrão draws his statistics from the following sources: Freitas (1867:10), 1855-1865; Primeiro Inquérito Parlementar sobre a Emigração Portuguesa (1873), 1866-1871; Cordeiro (1883:88), 1872-1881; Costa (1911:77), 1882-1885; Movimento da População - Estado Civil e Emigração, 1887-1900; Emigração Portuguesa, 1901-1912; and Boletim da Junta da Emigração e Anuário Demográfico, thereafter.

too much reliance on other sources, such as the Portuguese census of 1801[42], or the non-systematic Brazilian immigration statistics of the period 1820-1852[43]. Considering the latter source, it is highly unlikely that there were only 1,214 Portuguese immigrants to Brazil in the period 1820-1852 - particularly when 1,148 passports (the vast majority of which included Brazil as their destination) were issued in the District of Viana alone during the period 1835-1852! Further, focusing on the early nineteenth century, literary sources suggest that the wave of emigration sparked off by the relocation of the Portuguese monarchy in 1808 might not have subsided after its return to Portugal in 1821. In a provocative article that appeared in the national newspaper in January, 1838, Alexandre Herculano, a liberal whose political writings had a considerable impact in Portugal, attacked the Brazilians who, "... requiring the exploration and colonisation of the vast **sertão** (interior), insincerely seduced the youths of Portugal with promises of gold and high wages". He then proceeded to ask what advantages Portuguese emigration to Brazil, "the extent of which has been alarming in the last few years", could possibly bring. This statement, although likely to have been qualitative rather than quantitative, does indeed suggest that there may have been another surge of emigration at around this time; only further quantitative analyses will provide definite evidence.

Either way, it was in the second half of nineteenth century that emigration from Portugal really escalated, as it was doing throughout Europe. In the general terms of Serrão (1976c), population was increasing because of decreasing mortality, unemployment was increasing further because agricultural development was not accompanied by industrialisation, and Brazil was only too eager to absorb the resulting excess. From the data collected by Ferenczi & Willcox (1929) it is calculated that between 1855 and 1895

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[42] For example, Sousa (1977) attempts to estimate emigration by examining the sex ratios of the Portuguese census of 1801, but, as Reis (1987:98) points out, the poor quality of that enumeration and an inability to distinguish between various types of internal and external migration make the analysis extremely dubious.

[43] The most extensive set of these figures, covering the period 1819-1947, was compiled by Neiva & Carneiro (1950). Of course, their figures differ considerably at all times from those of Portuguese emigration, since they comprise permanent immigrants, whether or not they had legally emigrated from Portugal.

over half a million people (of a population which increased from 3.5 to 4.5 million during the same period) left Portugal for America - usually Brazil. Thereafter, the drain increased still further; Almeida & Barreto (1974) calculate that between 1886 and 1967, almost 42.7% of the natural increase in population was lost through emigration. Figure 2.1 shows the levels of legal emigration from Portugal between 1855 and 1973 (the data are reproduced in Appendix 2.A)[44].

Returning for a moment to the seventeenth century however, when competition from the Dutch and English for the Eastern trades increased sharply, Portuguese overseas interests were gradually reoriented towards the newly discovered Brazil. Since its initial colonisation Brazil absorbed the vast majority of Portuguese emigrants. Statistics available for the nineteenth century indicate that the proportion of emigrants choosing Brazil as their destination was 87% in the period 1855-1865 (Serrão, 1974:43) and 93% in the period 1891-1900 (Evangelista, 1971:143)[45]. This figure remained high throughout the later periods of heaviest emigration, except that between the end of the First World War and the Wall Street crash of 1929, a substantial proportion of the emigrants were travelling to the United States. Subsequently, during the 1960s, the surge of emigration to other European countries replaced that to Brazil (Arroteia, 1983:19). A study of Portuguese emigration would therefore be meaningless without a discussion of Brazilian immigration, particularly since more than five million (over 30%) of the immigrants that Brazil received between 1819 and 1959 were Portuguese (Neves, 1983).

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[44]Both the statistics compiled by Ferenczi & Willcox (1929), and those presented by Serrão (1974) were derived from passport registers and therefore exclude clandestine emigration.

[45]Those who didn't go to Brazil often went to Africa (usually Angola), the second most popular overseas destination during the nineteenth century. Official colonisation there began with the settlements established in 1839, and 1856, and ended in 1891. During that period, various attempts were made to redirect emigration flows there; for example, the Law of 1877, authorising the Government to give financial aid to those who agreed to stay for at least five years in one of the colonies (Lucci, 1914). The proportion of emigrants who went to the African colonies, however, only became significant after the Second World War.

Figure 2.1 Portuguese Legal Emigration, 1855-1973
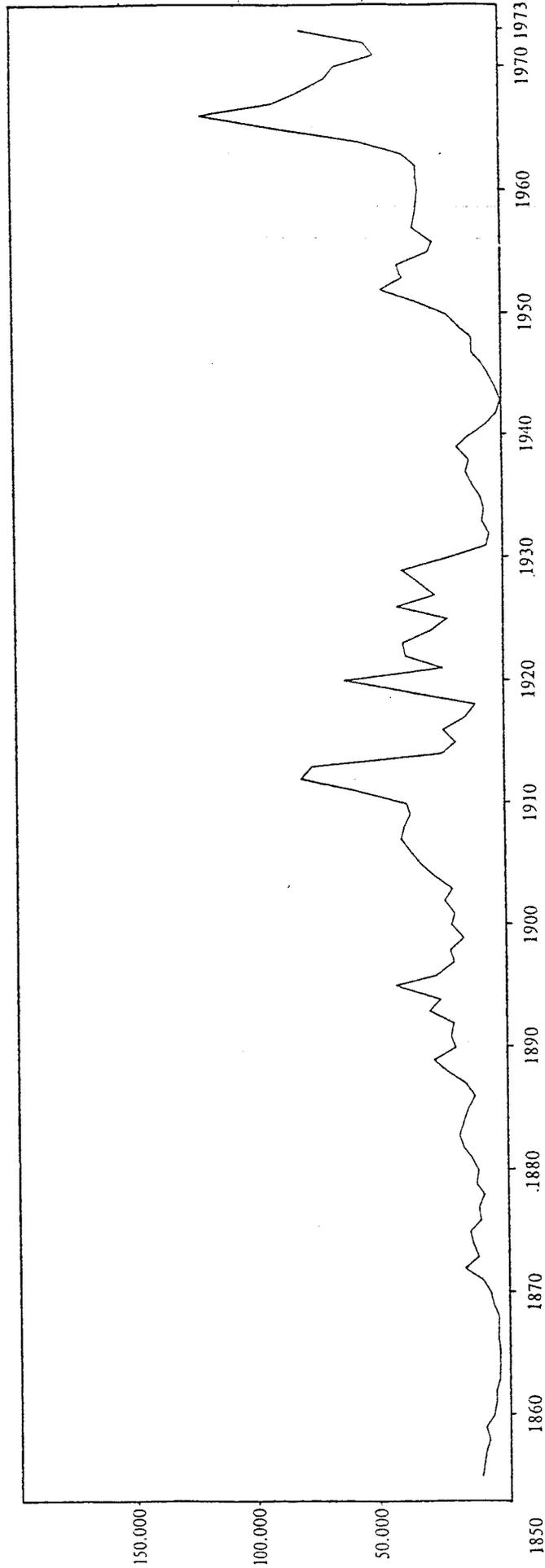
Source: Serrão (1970)

2.5 The Politics of Brazilian Immigration

Initially, the settlement of Brazil was directed from Europe, particularly Portugal, where it was promoted through the institution of donatory captaincy from 1530 (Johnson, 1972)[46], and by general government after 1548 (Alarcão, 1983:23). In 1576, the population is estimated to have been around 57,000 (Serrão, 1974:106); by 1772-82, 1.5 million (Maxwell, 1973:263); and by 1808, it had grown to four million (Naylor, 1931:161). It was only in 1808, however, when the Portuguese monarchy took refuge in Rio de Janeiro as a result of the French invasion of Portugal, that a Brazilian immigration policy was seen to emerge under the influence of Dom João VI[47]. This immigration policy was essentially one of further colonisation; it was gradually augmented and finally replaced however, by policies which were designed to guarantee an elastic supply of labour.

Both Carneiro (1950), and Hall (1969) identify the existence of two distinct flows of Brazilian immigration during the remainder of the nineteenth century: that resulting from attempts by the Government to introduce European colonists as independent farmers, and that from the efforts of the coffee planters to attract free wage labourers to supplement and eventually replace slaves. Although they coexisted, the former broadly dominated immigration before 1886, while the latter accounted for virtually all the immigration after that date. This temporal division is consistent with the three periods of nineteenth century Brazilian immigration outlined by Brito (1960): 1819-50, when immigration was sporadic; 1850-86, when it began to increase; and after 1886, when mass immigration flourished.

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[46]Donatory captaincy essentially involved the granting of commercial and other rights in order to encourage the settlement and development of vacant territory.

[47]The thirteen years during which the Portuguese monarchy resided in Brazil are seen to mark a turning point in many aspects of the development of Brazil (Costa, 1965).

2.5.1 The Establishment of Small Colonist Settlements

The earliest Brazilian moves to promote immigration resulted in the establishment of Novo Friburgo, where about 2,000 Swiss farmers were settled in 1818. Following independence (1822), the new Imperial Government of Brazil continued the same policy, offering many benefits to immigrants, including land on very generous terms. However, the early immigration projects halted rather abruptly in 1830 when one of the organisers got a bad reputation and reports of maltreatment of immigrants flooded the press; the outbreak of civil war in Brazil in 1831-43 ended the migration for a longer period (Erickson, 1976:175).

Although Chaves (1882) estimated that over 100,000 immigrants had been settled in these **nucleos** (settlements) by 1880[48], they were far less successful than had originally been hoped. Hall (1969:10) argues that while this failure was attributed by the authorities to the recruitment of unsuitable colonists[49], the remote position of the **nucleos**, and the poor quality of the land there, it was more fundamentally associated with the illegitimacy of the two assumptions under which the **nucleos** were created: that immigrants aspired to become small-scale farmers, and that **nucleos** satisfied this desire most effectively. This conclusion is misleading, however, since it would suggest that the Government was attempting to satisfy the desires of an uncontrolled flow of immigrants, whereas, in fact, it was actively seeking immigrants who would fulfil its own well defined needs.

Either way, it is interesting to note that broadly similar immigration policies pursued in Argentina proved extremely successful. For example, the main protagonist of the spectacular expansion in grain production in the province of Santa Fé between 1878 and 1895 was the European immigrant (Gallo, 1976:8-23); perhaps the most important differences there were the high quality of land, and the associated involvement of private entrepreneurs. On the other hand, in Brazil (at least in the case of 1868 and 1869 Swedish

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[48]Cited by Hall (1969:5).

[49]A clear example of the events leading to the arrival in Brazil of unsuitable immigrants can be found in Weaver's (1961) study of Confederate emigration to Brazil.

immigrants to Santa Catarina) many dissatisfied colonists, disappointed by the lack of possibilities of obtaining land and work, returned destitute to Rio de Janeiro, or were forced to resort to the coffee plantations of São Paulo (Stenbeck, 1973:57-62)[50].

The policy of attracting this type of immigrant was managed by a series of organisations, terminating with the creation of the Sociedade Central de Imigração in 1883 which, dominated by commercial figures, effectively sought only European immigrants on the two premises outlined above. However, unable to compete with, or even adopt a coherent policy towards the programs of heavily subsidised immigration initiated by the São Paulo planters which soon proved capable of providing immigrants without rural reform, this organisation too perished (Hall, 1969).

2.5.2 The Import of Free Wage-Labourers to Replace Slaves

Historically, slavery constituted a considerable component of the increase in the population of Brazil; since the indigenous Indians were few, and were not judged by the colonists to be a satisfactory labour force, Negroes were imported in large numbers. Mauro (1960) estimates that during the century from 1570 to 1670, 400,000 slaves were imported to Brazil[51]; Godinho (1978), surveying the estimates of earlier authors, concludes that between 300,000 and 450,000 slaves were imported from Africa during the sixteenth and first half of the seventeenth century.

Two centuries later, in the year 1850, the slave population of Brazil reached its highest estimated level of 2.5 million, but less than 40 years later, in 1888, this figure had been reduced by 80% to 500,000 (Leff, 1982:53)[52]. Besides illustrating the extreme

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[50]Cited by Runblom (1976b:308).

[51]Cited by Serrão (1974:97).

[52]Already by 1872, according to the census enumeration of that year, the slave population of Brazil had fallen to 1.5 million (Slenes, 1983:126).

demographic attrition that the slaves of Brazil were subject to[53], this comparison serves to emphasise how many must have been imported annually in order to maintain the population at its highest levels.

The first concrete step towards the abolition of the Brazilian slave trade was taken in 1810 when Dom João VI signed a treaty with Britain which included an agreement to adopt measures aimed at bringing it to an end. However, for twenty years after it was declared illegal in 1831, and despite mounting pressure from Britain, the government failed to suppress the trade. Only in 1850, when a new anti-slave trade bill was finally passed did the government for the first time have sufficient authority to enforce the law (Bethell, 1970). Even then, emancipation was deliberately gradual; it was not until 1871 that legislation was introduced which provided that children born to slave mothers were ultimately to be free[54], and a further 17 years before the Golden Law of 1888 finally and completely closed the institution of slavery in Brazil.

It is hardly surprising that slavery survived far longer than the inevitability of its demise suggested it would at the time - slave ownership in São Paulo was enormously lucrative (Conrad & Meyer, 1964)[55], and the productivity of alternative sources of labour was low in comparison (Hall, 1969)[56]. This is illustrated by Morais' (1870) estimate that only 7.5% of the coffee labour force in 1870 was free[57]; and, by the proportion of Brazil's slaves in the provinces of São Paulo, Minas Gerais, and Rio de Janeiro - this proportion increased as the nineteenth century progressed, until 1888

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[53] Carvalho de Mello (1983) presents the most recent estimates of mortality in the slave population of Brazil during the second half of the nineteenth century; he estimates that the expectation of life at birth was 18-23 years for males, and 20-26 years for females.

[54] The Rio Branco Law of 1871 (the Law of the Free Womb), however, included the important proviso that those born to slave mothers could be used by their mothers' owners, if they wished, until they reached the age of 21. This effectively meant that these ingênuos were little more than slaves, and guaranteed labour well into the twentieth century.

[55] Leff (1982), however, suggests that the potential profits of slavery declined during the nineteenth century as a product of increasing interest rates and a relatively long period (approximately ten years) before investment in slaves yielded positive income.

[56] The pioneer of free wage labour on plantations, Nicolau de Pereira de Campos Vergueiro, did however profess that his system was more profitable than slave labour (Bradford Burns, 1970).

[57] Cited by Hall (1969:12).

(Viotti da Costa, 1966:219). Neither is it surprising then, that the planters sought to maintain the elastic supply of labour that contributed so much to their prosperity by promoting mass immigration.

The earliest attempt to introduce free immigrants to the coffee industry was that organised by Senator Nicolau de Pereira de Campos Vergueiro who established a number of Portuguese farmers on **parceria** contracts[58] on one of his **fazendas** (plantations) in 1840. Although further attempts in the following years resulted in almost 3,500 colonists working on 30 plantations by 1855, there then followed a decline in the number of free workers during the 1860s. This has often been associated with reduced efforts to recruit new immigrants from Europe, but probably lies more directly in the dissatisfaction of both the planters and immigrants involved in the earlier schemes. While the planters complained that many of the immigrants were unsuitable, the immigrants accused the planters of exploiting them[59], and providing them with poor conditions. The extent to which the immigrants grievances were justified can be gauged from the fact that the Prussian government prohibited emigration to Brazil in 1859. In addition, Brazil's lengthy struggle against Paraguay (1865-1870) which revealed many weaknesses in the economy (Bradford Burns, 1970), can only have further deterred prospective immigrants, especially since even unsuspecting foreigners were apt to fall prey to the military press gangs (Hahner, 1986:50).

By the early 1870s, however, concern at the impending demise of slavery was accelerated by the first real shortages of labour, precipitating the need to seek methods of greatly increasing the imports of free wage labourers (Hall, 1969), and in 1873 the government was pressurised into passing the Decree which authorised the consuls in London, Liverpool, Switzerland, and Hamburg to provide free transport to colonists (Carvalho, 1876). The recruitment programs of the 1870s resulted in Italian immigrants outnumbering Portuguese for the first time. They were heavily criticised however,

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[58]The **parceria** system combined features of indentured service and sharecropping. It was not however particularly successful, and was replaced by a wage system in 1857.

[59]van Delden Laërne (1885) reported that the planters "... only want colonists to work the land in place of slaves."

for being marred by all the defects of earlier schemes. While planters were misled in Brazil, prospective emigrants in Europe were often deceived far more, typically being told that their passage would be free, only to be forced into five year repayment contracts upon arrival in Brazil. The agents' lack of scruples caused the same problems that had arisen in the establishment of immigrant colonies, so that "... planters and immigrants scarcely knew what to expect of each other" (Bradford Burns, 1970:186). The extent of these problems is illustrated by the passing of the draconian labour law of 1879 which provided heavy fines and prison sentences for colonists who violated their contracts (Hall, 1969).

To overcome these difficulties, a law was passed in 1881 which provided that immigrants needed to repay only half of their transportation costs to their employers, while the government reimbursed the planters with the remainder. Although relatively generous, these new terms did not provide any significant increase in the number of immigrants, and new legislation was therefore passed in 1884 providing that agricultural immigrants' passage costs be fully reimbursed upon arrival in Brazil[60]. The revised terms were again ineffective, however, because the most serious problem faced by European emigrants - the original payment of passage - had not yet been solved and planters remained unwilling to advance these sums. This final obstacle was overcome in 1885, when arrangements were made for the provincial government to pay immigrant contractors directly. Abuse of the system, however, finally led the planters themselves to establish the Sociedade Paulista Promotora de Imigração, a non-profit-making organisation, which signed its first contract with the Provincial Government in July, 1886. By the time the Society was voluntarily dissolved in 1895, it had recruited almost 220,000 immigrants[61].

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[60]This bill was later modified to stipulate that passage costs were only to be reimbursed after an immigrant had established himself for 30 days as a farmer or agricultural labourer.

[61]There is some disagreement about this figure: Hall (1969:98) cites almost 220,000, while Foerster (1919:285), in his classic study of Italian emigration, cites a far smaller number - 126,000.

2.5.3 Mass Immigration

During the ten years (spanning the Revolution of 1889) in which the Sociedade Promotora de Imigração recruited immigrants, Brazil received a total of almost one million immigrants, more than half of whom were subsidised. Indeed, of the 1.5 million immigrants to São Paulo between 1889 and 1915, the majority of which were Italian, almost one million had their overseas transportation charges paid by the State (Naylor, 1931:162)[62].

At the same time, these figures also suggest that the mass immigration which flourished in the late 1880s cannot be attributed solely to the efforts of the planters; many Europeans emigrated spontaneously, without subsidy, disproving the notion that the success of immigration policies was proportional to expenditure (Carneiro, 1950). It might even be said that the mass immigration continued despite the planters, since the continued poor treatment of immigrants led Italy to ban artificial aids to emigration from March, 1889, to August, 1891. The mass immigration to Brazil of the 1890s is somewhat atypical though, in that it is more attributable to push factors such as the severe economic depression in Europe than to pull factors in the immigrant country (Mortara, 1954).

As the numbers of immigrants changed, so did the distribution of their origins. While in the 1870s, of the 194,000 immigrants to Brazil: 35% were Portuguese, 24% Italian, 8% German, 4% Russian, 4% Austrian, and 25% of other nationalities; in the 1890s, of the 1.2 million immigrants: 57% were Italian, 18% Portuguese, 14% Spanish, 3% Russian, 3% Austrian, and 5% of other nationalities[63]; for the Province of São Paulo alone between 1887 and 1890, 73% of immigrants were Italian, 11% Spanish, only 10% Portuguese, and 6% of other nationalities (Holloway, 1980). These figures illustrate the extent to which free wage-labourers for the coffee plantations were drawn from Italy; they also demonstrate that the increased flow of

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[62]Foerster (1919) asserts that half of those who came to Brazil after 1889 received free passages from the Province of São Paulo; and that of the 804,598 immigrants entering São Paulo between 1887 and 1906, two-thirds were Italian (cited by Erickson, 1976:175-176).

[63]Calculated from the data presented by Neiva & Carneiro (1950).

Portuguese immigrants is less likely to have been directed toward São Paulo.

It is worth noting that although Brazil remained the most popular destination of Portuguese emigrants, it was by no means as popular throughout Europe; for example, Runblom (1976b:303) notes that Swedish emigrants to Brazil were those who had few possibilities of departing on their own, and who therefore relied on subsidised passages. Carneiro (1950) argues that Brazil received far fewer immigrants than the United States or Argentina mainly because of the inferior status of labour as a result of the **latifundia** system of agriculture, and the persistence of slavery. Of course, other important differences between countries of destination were no doubt involved, such as economic conditions (e.g. wages), cultural and linguistic links between some Old and New countries (e.g. Portugal and Brazil), and other factors (e.g. climate).

In this context, perhaps the most important comparison that can be made is between Italian emigration to the aforementioned three countries. In the last two decades of the nineteenth century, Brazil received 770,000 Italian immigrants, Argentina received 720,000, and 670,000 were received by the United States[64]. During the same period however, short-term variations often resulted in one of the three countries receiving well over half the immigrants; with respect to Argentina, Cortés Conde (1979) demonstrates some relationship between wage-level differentials and levels of immigration. Thus, it might be suggested that while cultural and linguistic links dominated long-term preferences, economic and other shorter-term factors were far more important where such links are less predominant.

Returning to Brazil, after the First World War, the Portuguese dominated immigration to Brazil once more, and continued to do so until the late 1950s (except between 1932 and 1935, during which period almost 70,000 Japanese emigrated there) (de Ávila, 1931).

Considering variations in the level of immigration, de Ávila (1954:50) illustrates a close association between the level of immigration to São Paulo and the price of coffee at the Port of

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[64]These figures are the total numbers of Italian immigrants in the period 1881-1899 (**Sommario di Statistiche Storiche Italiane**, 1861-1955; the 1881-1903 data for Argentina, Brazil, and the United States are reproduced in Cortés Conde, 1979:266).

Santos; this association is strongest in the period between the two World Wars, and weakest in periods of extremely high immigration, such as the mid-1890s and the years immediately preceding the First World War.

In conclusion, it is worth noting that the demography of Brazil is argued to have developed relatively independently of levels of immigration. Despite the frequency and size of the great waves of immigration, which continued unchecked until several laws were passed, between the Revolution of 1930 and the Second World War, aimed at limiting the "orderless ingress of foreigners", Mortara (1954) argues that the substantial increase in the Brazilian population during the same period (from 9.9 million in 1872 to 14.3 in 1890, 17.4 in 1900, 30.6 in 1920, and reaching 41.2 million in 1940) was attributable more to high fertility and low mortality than to immigration.

2.6 The Politics of Portuguese Emigration

The considerable role that emigration played in the evolution of the demographic structure of Portugal over the last 500 years simultaneously ensured its adoption as a topic of much dissent. In contemporary Portugal the great debates over emigration continue, and researchers have therefore increasingly turned to the past in the hope that a better understanding of earlier times might lead to a more fruitful analysis of modern issues.

Historically, attitudes towards emigration were complex, with society undecided as to whether emigration was a good or a bad thing, and the governments remaining wary of directly prohibitive measures in fear of the strong reactions that might be provoked (Carqueja, 1916:431). As Halpern Pereira (1981:8) emphasises, Portuguese attitudes to emigration have almost always been ambiguous, even contradictory, reflecting a dilemma faced by the emigrants and their families, and have tended if anything to control rather than inhibit.

As early as the sixteenth century, the exit of large numbers of people whose primary motive was the desire for profit, and their subsequent return, were seen to be causing a deterioration in the moral health of the kingdom (Macedo, 1935:283); it is even suggested (Alarcão, 1983:25) that the idle habits of many return migrants led Dom João III and his successors to introduce several laws against vagrancy (1538; 1544; 1570; 1579), rules against luxury (1559; 1570), etc.

In the seventeenth century, Severim de Faria in **Notícias de Portugal** asked **"por que falta a gente deste reino?"** (why are the people of this kingdom missing?)[65]; a question probably prompted by the departure of large numbers of people during the period of Hapsburg rule (1580-1640), which motivated the first legislation introduced to reduce emigration - passed in 1646 and 1660 (Serrão,

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[65]Quoted by Coelho (1978:283).

1974:106). Again in 1720, concern at the numbers leaving Portugal to strike it rich in Minas Gerais led the Portuguese Government to pass legislation aimed at stemming the flow (Costa, 1965)[66]. These restrictions seldom lasted long though. Less than half a century later, Sebastião José de Carvalho e Melo, the Marquis de Pombal, was fervently supporting the strategically-important colonists of the Companhia do Grão Pará e Maranhão in the exploitation of northern Brazil, and those who were setting out for Santa Catarina and Rio Grande do Sul[67]; but the mines of Minas Gerais still attracted many emigrants (Telles, 1914).

Focusing on the nineteenth century, important bodies of Portuguese legislation concerning emigration are summarised in Table 2.4. As can be seen, the years immediately following the flight of the Portuguese government to Rio de Janeiro, and the ensuing French invasions of 1807, 1809, and 1810, are marked by prohibitive emigration legislation; nevertheless, it is known that between 1808 and 1817, 24,000 Portuguese entered Rio de Janeiro (Telles, 1913:29). This official repression effectively continued throughout the political struggles of 1820-1834, until the liberal reforms of 1835. However, the effectiveness of the legislation is impossible to quantify since, apart from the figure presented by Telles, no information on the level of emigration during this period exists.

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[66]The Law of 20 May, 1720, authorised only civil servants, ecclesiastics, and those conducting their business to leave Portugal. Further, those engaged in commerce could only travel to the Captaincies if they were to return, or if they were on particularly urgent business. Punishment of offenders was severe, with the confiscation of goods and the loss of nationality (Costa, 1911:162).

[67]The colonisation of Rio Grande do Sul only began in 1737, in order to support Portuguese claims to possession, but it soon assumed a momentum of its own, becoming Brazil's region of fastest growth between 1780 and 1820 (Bauss, 1983).

Table 2.4a Nineteenth Century Portuguese Emigration Legislation

Date	Legislation
6 3 1810	Prohibitive passport legislation.
25 5 1822	Prohibitive passport legislation retained.
30 5 1825	Prohibitive passport legislation further retained.
20 4 1826	The Constitutional Charter actually specified that migration to, within, and from the realm should be entirely free (Art.145) - in direct contradiction with the operative legislation.
15 1 1835	Passports to be issued by the Civil Administration of the newly formed districts; particulars to be recorded in Passport Books.
18 7 1835	Administrative division and organisation: confirms Decree of 15 January (Art.46).
31 12 1836	Approval of Administrative Code of 1835: reconfirms legislation of 1835 (Art.109).
18 3 1842	Administrative Code: incorporates earlier legislation (Art.227).
26 11 1851	Repression of clandestine emigration - including measures such as the examination of emigrant papers at destination; this appears to be the first evidence of governmental concern at emigration levels.
20 7 1855	Suppression of contraction of emigrants by **engajadores** - this was the first law aimed directly at the repression of the (clandestine) emigration process.
9 2 1858	Regulation of transport of emigrants: captains carrying too many (more than 2 per 5 tons) were to face a fine of 2,000 **contos**, and 6-12 months imprisonment.
4 6 1859	Repression of clandestine emigration to evade military conscription: males aged 14-21 years only to be issued with passports if in possession of license of exemption from military conscription.

Table 2.4b Nineteenth Century Portuguese Emigration Legislation

Date	Aspect
16 12 1862	Proof of payment of passage: receipt to be presented at passport issue office.
31 1 1863	Suppression of contraction of emigrants by **engajadores**.
7 4 1863	Punishment of attempted clandestine emigration: Captain of ship - 400$000 **reis** fine; emigrant - 20$000 **reis** fine, or one month in prison.
6 9 1866	Issue of passports to minors: subject to consent of public ministry.
26 6 1867	Administrative Code - does not appear to incorporate emigration legislation.
8 4 1870	Proof of payment of passage: duplicate of receipt to be archived.
27 5 1871	Suspension of need for passports for intra-European travel.
28 3 1877	Stimulation of return migration from Brazil: repatriates over the age of 26 exempt from military conscription (ispired by the first parliamentary inquiry, 1873).
12 9 1887	Tightening of military conscription legislation.
1896	Relaxation of military conscription legislation of 1887.
23 4 1896	Repression of clandestine emigration: formation of special police force.
15 7 1905	Dispensation of the need to carry passports for all but third class passengers on steam-ships leaving Europe.
25 4 1907	Modification of legislation of 1905: passports only needed by nationals travelling as last-class passengers on steam-ships engaged in the transport of emigrants, and bound for foreign ports.

Sources: Costa (1911), Commission of students (1876), Vasconcellos (1930), Lencastre (1869).

During the period 1835-1851 - the first phase of liberalism, little legislation concerning emigration was passed; that which was, may be described as administrative reform (characteristic of the period) concerned with details of the issue of passports. This is partly because the period was marred by further political instability, but is probably more directly associated with the lack of official statistics on the level of emigration. Although the particulars of each passport were being recorded by district authorities, they were not compiled nationally; only anecdotal information of the type discussed in Section 2.4 is available.

The roots of Governmental concern at the levels of emigration are uncertain, but might be inferred from the bodies of legislation passed during the 1850s and 1860s. Conscription legislation[68] provided for the recruitment of any male reaching the age of 21 between each 1 February and the following 31 January, or the age of 22 if they had been missed in the previous twelve month recruitment period. Military service often lasted six to seven years; and, exemption from conscription could only be granted where a male had dependents. It is likely that increasing numbers of males failing to report for military service, and unofficial details of clandestine emigration led the government to introduce legislation designed to curb this trend. At the same time, reports of the poor conditions suffered by emigrants, both on their journey to Brazil and upon their arrival, prompted the attempted control of legal emigration, and the complete suppression of clandestine emigration, especially that organised through the **engajadores** (emigrant contractors)[69].

The escalation of emigration during the third quarter of the nineteenth century, when the Brazilian immigration policies were beginning to take effect (Halpern Pereira, 1981:16), motivated the first parliamentary inquiry into emigration (1873) - a study of emigration during the period 1866-1871. It was this study that first quantified the extent to which emigrants originated from densely

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[68] Legislation of 27 July, 1855; 4 June, 1859; 1 July, 1862; and 9 September, 1868.

[69] Brettell (1986:83) suggests that **engajadores** frequently offered a pound to anyone who was able to convince another person to emigrate.

populated areas with extreme fragmentation of landholdings[70]. It also concluded that emigration was not caused by miserable conditions or unemployment, since there was in fact a shortage of labour in the country. This conclusion however, was drawn from the fact that between 1866 and 1871, while 37,444 Portuguese had emigrated, 139,637 Spaniards (mainly from Galicia[71]) had migrated into Portugal (Serrão, 1974:157)[72]. In summary, the inquiry sought remedies for what were described as the problem of emigration, and suggested several measures that might be adopted to that end; these measures were mostly indirect national policies concerned with reducing the need to emigrate, but included such direct measures as the attempt to attract previous clandestine emigrants back to Portugal (see resultant Law of 28 March, 1877).

It was only during the last quarter of the nineteenth century however, when the flows of emigrant remittances became substantial, that the discussion became far more polemic. Essentially, the debate polarised into two camps: those who sought to make the most of the phenomenon, and those who continued to view it at as a problem for which a solution existed. In this context, non-quantitative theories of the capital Portugal lost with each emigrant - predecessors of modern economic theory - were formulated; however, Pércheiro (1878:30), while emphasising the loss of capital that each emigrant represented, failed to consider the balancing nature of remittances or return migration. Perhaps the best known example of the argument forwarded by the former camp, is the observation, prompted by emigrant remittance levels, of Alexandre Herculano de Carvalho (1882:112) that "o Brasil é a nossa melhor colónia, desde que deixou de ser colónia nossa" (Brazil is our best colony, since it ceased to be one of our colonies).

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[70] This association has subsequently been identified as one of the more important causes of emigration. For example, Costa (1928) concludes that the extreme partition of property in the Minho was an obstacle to the development of agricultural science and increases in labour efficiency, resulting in emigration being the only option available for many to improve the circumstances of their families.

[71] Many of the Galicians were seasonal migrants, entering Portugal each year to participate in the cereal and wine harvests (Brettell, 1986:82).

[72] Contemporary authors (Serrão, 1976c:87; Halpern Pereira, 1981:13) argue that unemployment, caused by rapid population increase, was substantial.

In summary, during the last two thirds of the nineteenth century, emigration was only legal for those travelling with valid passports, the issue of which was subject to exemption from military conscription and other contractual obligations, and noninvolvement in any legal proceedings. Of these restrictions, the most important was the requirement that males be exempt from military conscription; this is deemed to have been the greatest cause of clandestine emigration, as it was throughout Europe. A second stream of clandestine emigration also existed however, caused by the prohibitive costs involved; this consisted of those who could not afford to pay their passage in advance (perhaps including those who were not free of contractual obligations, or who were involved in legal proceedings). Indeed, it is somewhat ironic that legislation aimed at the protection of Portuguese emigrants, through the suppression of **engajador** activities, actually drove many potential emigrants to resort to seeking the services of an **engajador**. Of course, the second stream of clandestine emigration was practically eliminated when the politics of Brazilian immigration provided free passages without (direct) contractual obligations.

Finally, Brettell (1986:136) points out that not all Portuguese women were free by law to emigrate; single women under the age of 21 had to have the permission of their fathers, married women required that of their husbands; this point is rarely mentioned elsewhere in the literature.

2.7 Studies of Portuguese Emigration

Over the past 100 years, the volume of published work on Portuguese emigration has varied with the level of the phenomenon itself. This has resulted in a large body of literature written in the late nineteenth and early twentieth centuries, together with an increasing number of more recent works. The resurgence of interest since the early 1960s, when emigration began to escalate to its highest recorded levels, accompanied a redevelopment of nineteenth century Portuguese history (which has occurred largely since the Revolution of 25 April, 1974)[73]. Nevertheless, to date, only the works of Godinho (1978), Serrão (1974; 1976b; 1976c), and Halpern Pereira (1981) have been entirely devoted to discussion of historical emigration flows. Of these, Godinho and Serrão adopt a historical-structural perspective, providing little technical analysis.

Halpern Pereira (1981:9) heavily criticises this perspective, emphasising that the emigration flows assumed important new characteristics during the nineteenth century; however, her own discussion suggests a limited acquaintance with the extensive literature of the broader European phenomenon[74], and, therefore, her analysis (also non-quantitative) does not readily provide a framework for cross-national comparison. In short, in comparison with the literature reviewed in Section 2.3, even the work of contemporary Portuguese scholars tends to be rather poor.

Since many of the works concerned with emigration have tended to divide the subject into several main topics: emigrant characteristics, clandestine emigration, return migration, and emigrant remittances, this outline will be adhered to in the review of studies of Portuguese emigration presented in this Section.

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[73] In his survey and evaluation of Portuguese migration studies, Ferreira de Paiva (1983:138) found both the quantity and quality of pre-1974 work poor; an opinion also held by Almeida & Barreto (1974:156), who write that, apart from a few economic studies, knowledge of emigration relies heavily on popular dramas and tragedies, such as Ferreira de Castro's **Emigrantes**.

[74] For example, reviewing the nineteenth century emigrations from Europe, Halpern Pereira (1981:10-11) presents the long refuted agrarian myth of emigrants mainly comprising fugitives of proletarianisation, and characterises the flows from northern and western Europe by the single example of English emigration, which she rather inadequately describes as "frequently having been of families" and "having the aim of permanent settlement".

2.7.1 Emigrant Characteristics

Traditionally, Portuguese emigration has been viewed as a young male phenomenon, but the study of emigrant characteristics has remained limited by the acute shortage of systematically collected statistics. The demographic statistics available are: from 1855, the total number of emigrants per year; from 1872, the division of these totals by sex and into two age groups - under 14 years, and 14 years and over (information collected in order to trace the extent to which young males were being sent abroad to avoid later military conscription); from 1941, six smaller age groups; and, from 1955, ages in five-year intervals. Again, it is somewhat surprising that official statistics remained so crude for so long, when detailed information had been collected at the individual level since 1835.

From this material it is evident that emigrants were overwhelmingly male until the twentieth century. The proportion of women among emigrants has increased since the statistics were first collected; in recent years, this proportion has even exceeded 50% for those emigrants above the age of 40, because of the number of wives emigrating to rejoin their husbands (Evangelista, 1971:127). These trends contrast sharply with those outlined for the rest of Europe in Section 2.3; while the number of people emigrating individually was increasing throughout the rest of Europe, it was declining in Portugal. There are two main explanations for the earlier predominance of male emigrants, and the virtual absence of female emigrants. First, as mentioned in Section 2.6, many females were not even free by law to emigrate. Second, males had traditionally been the ones who emigrated - they crewed the ships that were involved in the creation and maintenance of the Portuguese Empire, and that traded throughout the known world; this is associated with the ideology of return migration (discussed in Section 2.7.3).

The proportion of nineteenth century emigrants who were under the age of 14 was sometimes as high as 30% of all emigrants. These extremely young emigrants, often sent to avoid later military conscription in Portugal, were the subject of much controversy during the second half of the nineteenth century. The Consul in Rio de

Janeiro reported in 1875 that it was the young **caixeiros**[75] who were most vulnerable to maltreatment upon arrival in Brazil, and how those in Rio de Janeiro were suffering particular hardship[76].

Occupational information was initially nonexistent, so nineteenth century studies relied heavily on non-quantitative information. The first parliamentary inquiry (1873:9), for example, resorted to quoting Mr. Phipps, a British emissary in Rio de Janeiro, who judged that "Portuguese immigrants were practically all engaged in small trade and resided in the cities of Rio, Bahia, and Pernambuco". This estimate of occupational structure, albeit non-quantitative, was to change radically with the escalation of mass emigration at the end of the nineteenth century. Carqueja (1916:400), using some of the first available statistics, finds that the vast majority of emigrants between 1911 and 1913 were engaged in agriculture. But then, so was the vast majority of the population. More recently, Serrão (1976c) uses the occupational distribution of Portuguese arrivals and deaths in Bahia during the period 1864-1872 to illustrate the high proportions of **caixeiros** and merchants among emigrants.

The origins of emigrants are presented in all but a very few studies of Portuguese emigration. However, only too often they simply present the distribution of emigrants by district, and take no account of differences in population size between these areas (e.g. Serrão, 1974:136-140). The popular view that the majority of emigrants until the mid-nineteenth century originated from the country between the Douro and Minho rivers (the Minho province) may essentially be true, but it must be borne in mind that about a quarter of the country's population lived there. The first comparison of emigration rates, rather than totals, between different districts was carried out by Oliveira Martins (1891). Carquejo (1916:388) compares the number of emigrants per 100,000 population in each district for the four periods 1866-1871, 1880-1882, 1896-1898,

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[75]**Caixeiros** were apprentices, cashiers, etc., usually employed in commerce. It is well known that during the nineteenth century many young males were sent to work in the merchant and trade houses in Brazil which were owned by older emigrants already settled there.

[76]Cited in the study of emigration prepared by a commission of students at Coimbra University (1876:105-6).

and 1911-1913. His analyses show that in the first period the highest rates of emigration were from the districts of Porto, Aveiro, Braga, Viana, and Vila Real, whereas by the last period, emigration rates were highest in Bragança, Vila Real, Viseu, Guarda, and Aveiro. Comparison with Figure 2.2 which shows the districts of Portugal, illustrates the gradual shift from the coastal to the inland districts of northern Portugal. More recently, however, the increase in emigration since 1950 has affected not only the aforementioned regions, but also the centre and south of Portugal, thus reducing regional heterogeneity (Reis, 1987:110).

Reis (1987) uses evidence at the level of borough[77] from the censuses of 1864 and 1878 to define a regional distribution of male net absences for each of the two years. By clustering these data, she identifies five groups of boroughs (see Figures 2.3 and 2.4) with the estimated levels of male net absence shown in Table 2.5.

Table 2.5 Male Net Absences (%) by Groups of Boroughs

Census Year	Borough Group	Age Groups 15-34		35-59	
1864	1	-45.7	(7.7)	-23.5	(7.4)
	2	-63.8	(11.4)	-37.0	(7.7)
	3	-16.9	(9.1)	-13.0	(5.2)
	3A	- 4.3	(9.2)	1.8	(5.2)
	4	11.3	(7.6)	18.2	(7.0)
1878	1	-61.1	(8.6)	-40.4	(8.7)
	2	-37.1	(9.5)	-32.9	(7.2)
	2A	-39.7	(6.5)	-17.0	(4.4)
	3	-12.8	(9.8)	- 5.1	(6.5)
	4	8.1	(11.3)	14.1	(7.5)

Note: Standard deviations of estimates are in brackets
Source: Reis (1987:246)

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[77]Boroughs are the administrative units of which districts are comprised. Between 1864 and 1878 there were a total of 263 boroughs, in 17 districts.

Figure 2.2 The Districts of Portugal
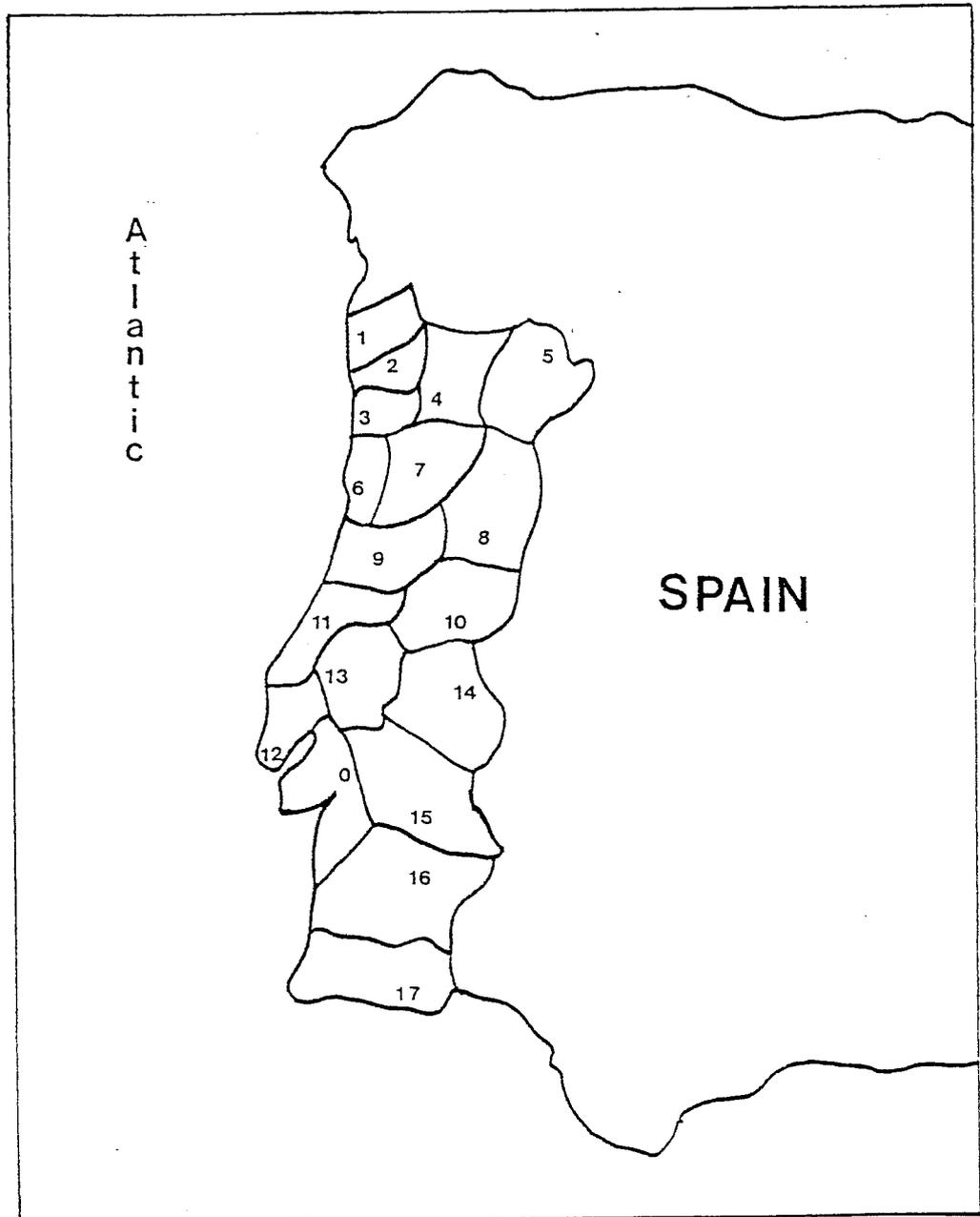
1. Viana do Castelo	10. Castelo Branco
2. Braga	11. Leiria
3. Porto	12. Lisboa
4. Vila Real	13. Santarém
5. Bragança	14. Portalegre
6. Aveiro	15. Beja
7. Viseu	16. Évora
8. Guarda	17. Faro
9. Coimbra	0. Setúbal (1926-)

Figures 2.3 Male Net Migration by Groups of Boroughs, 1864 and 1878
   and 2.4
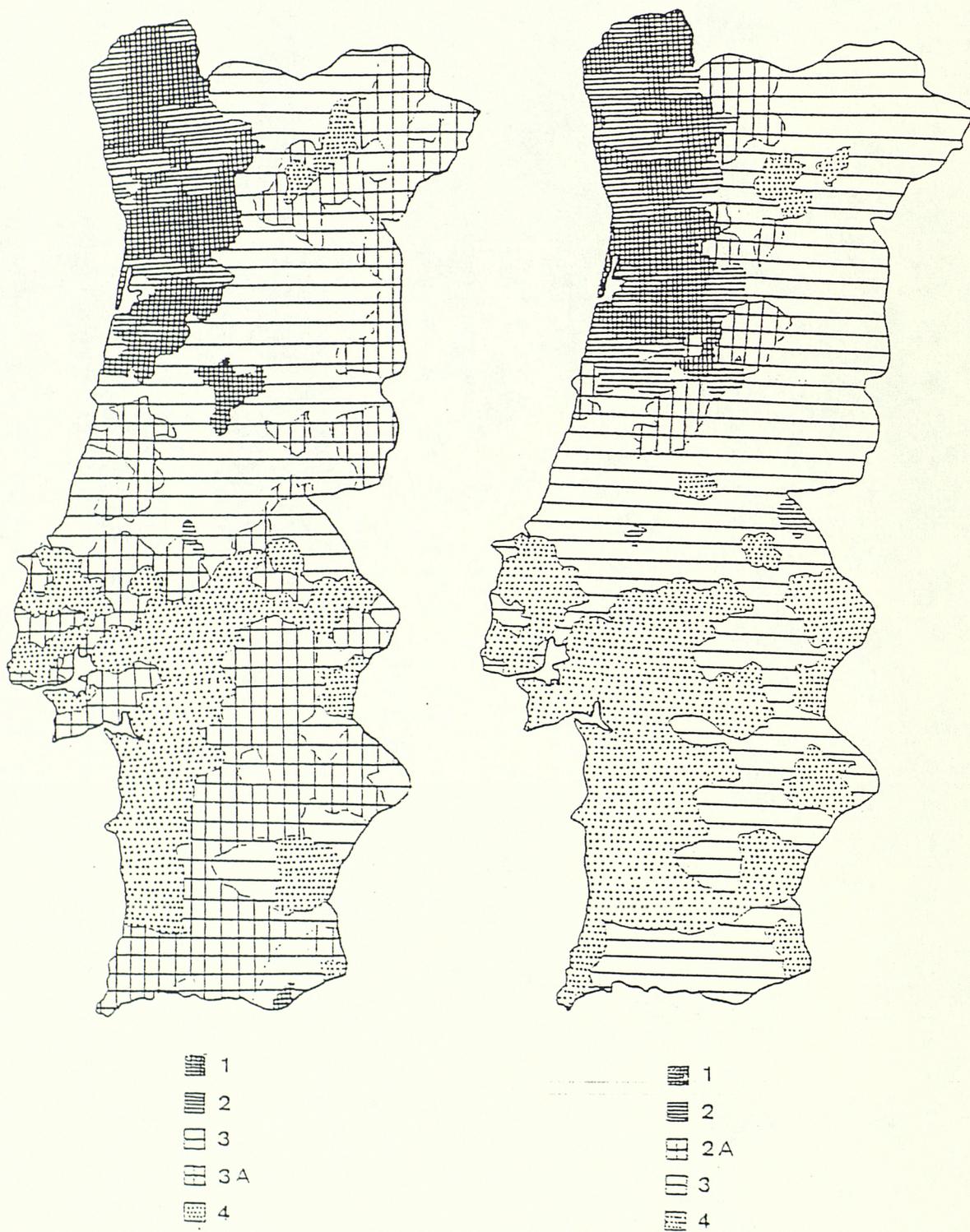
Source: Reis (1987:245)

The first two groups identified in her analyses are those with heaviest out-migration, defining a precise region in north-west Portugal that includes the Districts of Viana, Braga, Porto, Aveiro (numbers 1, 2, 3 and 6 in Figure 2.2), and several boroughs of the districts neighbouring these region. Between 1864 and 1878, this region can be seen to grow slightly to its south, and inland to its east. The next two groups define a region covering the eastern inland areas of the country in which out-migration was moderate. The fifth group defines a region including Lisboa and the coastal region to its south which experienced net male in-migration.

Considering ports of embarkation and the journey itself, the vast majority of (legal) emigrants departed from either Lisboa or Porto; of these Porto was predominant - probably because of the large proportion of emigrants that were from the north. Although steam ships were being employed in the transport of emigrants, they were mostly foreign. Official statistics on the numbers of ships used during the period 1870-1874 show that of the 247 Portuguese vessels, 96% were sailing ships, while of the 502 foreign vessels, 99% were steam ships[78]. The cost of passage from Lisboa to Rio de Janeiro is recorded in 1856 as being 144$000, 117$000, and 38$000 for first, second, and third class respectively (**A Aurora do Lima**, 13 December, 1856); in order to facilitate some comparison, the mean wage for day-labourers in the District of Viana is recorded as being of the order of 200-300 **reis** in 1859 (Coelho, 1860:242).

Finally, with respect to destination, Morais (1873) explains the preference of Portuguese for Brazil as being partly due to the fact that emigrants had little choice; emigrants from Porto went to Brazil because no boats were leaving for anywhere else, even the United States. Within Brazil, it is suggested that a large proportion of the Portuguese immigrants settled in Rio de Janeiro, performing much of the unskilled labour of the capital city (Naylor, 1931:166; Serrão, 1976c:96; Hahner, 1986:46), rather than working on the coffee plantations of São Paulo[79]. It is interesting to note that while

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[78]**Documentos Apresentados às Cortes na Sessão Legislativa de 1875: Emigração Portuguesa** (cited by Serrão, 1980).

[79]However, Serrão (1976c:92) suggests that many of the Portuguese emigrants did in fact "replace slaves".

many Spanish emigrants settled in Brazil, very few Portuguese emigrants settled in Argentina[80].

An attempt to identify the reasons for emigration was made by Lucci (1914), using surveys of emigrants taken between 1901 and 1906. The results showed that the vast majority (over 85%) were going to "improve their fortune". However, this result can be attributed to the formulation of the questionnaire, since, with few alternatives, the above category encompassed virtually all the reasons that emigrants might have actually had. The surveys therefore failed to identify exactly why emigrants thought that they might improve their fortune in Brazil, or even to what extent they may have wished to stay in Portugal had circumstances been different.

Little else is known about the earlier emigrants, except that those who went in large numbers in the late nineteenth and early twentieth centuries are often reported to have been illiterate peasants incapable of work other than manual labour (Carquejo, 1916:403; Serrão, 1974:53). Nevertheless, the characteristics of more recent emigration to Brazil, during the last wave that occurred in the early 1950s, is thought to have differed little from those of earlier generations. Brito (1960) concludes that the majority of the emigrants were still "the small farmers of northern Portugal who owned a small tract of land and had sold or mortgaged it to pay for their travel"; that the landless labourers of southern Portugal were unable to raise these necessary sums; and, that life in Brazil, generally employed in civil engineering, or small commerce, proves to be little better than the life they had left behind in Portugal.

Perhaps the only technical analyses of Portuguese emigration besides that of Reis (1987) are those conducted by Nazareth (1976; 1977). Studying the effects of emigration on the demographic structure of the Portuguese population between 1930 and 1970 using forward and backward population projection techniques, he concludes that the increasing proportion of the population aged less than 19 and more than 60 exaggerates the perceived decline of mortality and, perhaps against intuition, has a negative effect on the perceived

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[80]In the period 1857-1926, of immigrants to Argentina, 47% were Italian, 32% were Spanish, and less than 1% were Portuguese (Bunge & Mata, 1931:153).

fertility decline[81]. Further investigating the effects of emigration on the family, he confirms that aggregate marital fertility was only higher in regions experiencing considerable emigration because of the effect of an intermediate variable - family structure.

2.7.2 Clandestine Emigration

As mentioned in Section 2.4, clandestine emigration consisted of two streams: that of males aged 14-21, who were unable to obtain passports because of military conscription legislation, and that consisting of people for whom the price of a passport and passage was prohibitively high[82]. In addition, Halpern Pereira (1981:22) refers to two different types of clandestine emigration: that without passport - embarking mainly from Lisboa, and that with false passports obtained from **engajadores** - embarking mainly from Vigo, Galicia. Essentially, the **engajadores** arranged transportation to Brazil, in return for which emigrants worked under obligation until they had repaid their incurred debt. Considering the length of military service, it is hardly surprising that families - faced with a substantial loss of income if a male was conscripted - often sent boys under the age of 14 to work in Brazil as **caixeiros**, and helped those aged 14-21 to evade military service by emigrating illegally.

Of course, by its very definition, clandestine emigration is difficult to measure; no reliable estimates of clandestine emigration from nineteenth century Portugal exist. Nevertheless, a number of Portuguese scholars suggest levels of clandestine emigration; these are shown in Table 2.6, together with more (reliable) recent estimates. It must be emphasised that no methodology of estimation is presented by any of the early authors. Indeed it is likely that some of the suggested levels are little more than guesstimates from information such as the proportion of males failing to report for military service, while others, for example those of the well known socialist republican writer and politician Joaquim Pedro de Oliveira

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[81]Reviewed by Reis (1987:108).

[82]Even after free passage to Brazil became available, numerous complaints began to be directed at the price of passports (4$500 **reis** in 1891) (**A Aurora do Lima**, 16 January, 1891).

Martins, may have been associated more closely with the impact sought; they must therefore be treated with utmost caution. Later estimates, such as those of Evangelista, are more likely to be based on some formal technique of estimation.

A comparison of Portuguese official emigration statistics (Serrão, 1974; Appendix 2.A) with Brazilian immigration of Portuguese citizens (Neiva & Carneiro, 1950; Appendix 2.B) yields the following periods during which the latter exceeds the former: 1858-1869, 1890-1891, 1914, 1927, and 1931-1935. At all other times, Portuguese emigration figures exceed those of Brazilian immigration. The first two of these periods, which lie within the scope of this study, are considered more closely. During the first period (1858-1869), Portuguese legal emigration totalled 69,259 and Brazilian immigration totalled 72,251 - a difference of 2,992; this period immediately follows the introduction of the 1850s conscription legislation. During the second period (1890-1891), Portuguese legal emigration totalled 44,199 and Brazilian immigration totalled 53,523 - a difference of 9,324; this period lies in the period of tighter conscription legislation (1887-1895), and in the middle of an agricultural crisis. This evidence, albeit somewhat crude, provides some initial indication of clandestine emigration levels.

In conclusion, although clandestine emigration is by its very nature difficult to measure, the evidence presented in this Section suggests that clandestine emigration was an important component of total emigration from Portugal. In Section 3.9, a population-model estimate of clandestine emigration from just one of the districts of Portugal - Viana - during the second half of the nineteenth century, will help to quantify the extent of the phenomenon.

Table 2.6 Evidence of Clandestine Emigration Levels

Period	Level (%)	Date of Source	Source
1855-1865	33	1867	Freitas. Cited by Serrão (1974:39). (no method of estimation is given)
	20	1872	Portuguese Consul in Rio de Janeiro; this estimate was irrespective of the number illegally contracted by the **engajadores**. Cited in the First Parliamentary Inquiry of Emigration (1873:41). (no method of estimation is given)
	30-120	1885	Oliveira Martins - "clandestine emigration probably increases emigration from 10,000-19,000 to 22,000-25,000 per annum". (no method of estimation is given)
	≤50	1934	Simões (:35). (no method of estimation is given)
1891-1961	33	1971	Evangelista (:123). Cited by Serrão (1974:38). (no method of estimation is given)
1961-1965	33	1968	Franco (:115) - official estimate. Cited by Serrão (1974:62). (no method of estimation is given)
1969	156	1970	**Boletins da Junta de Emigração** - official estimate. (cited by Reis, 1987:105). (no method of estimation is given)

Note: The level of clandestine emigration is given as a percentage of recorded legal emigration; although this initially appears to be somewhat illogical, it avoids the use of an unknown quantity (clandestine emigration) in both the numerator and denominator of the ratio.

2.7.3 Return Migration - The Brasileiro

In the sixteenth century, Pyrard de Laval noted that after nine
or ten years in one of the colonies it was common for the Portuguese
to return home rich[83]. With the return to Portugal of the
seventeenth and eighteenth century miners who had found gold in the
mines of Minas Gerais, the myth of fortune and return grew;
irrespective of the number who came back poor, and the number who did
not come back at all.

Later, the **mineiro de torna viagem** (return migrant miner) of the
eighteenth century became the **Brasileiro** of the nineteenth
(Herculano, 1882:112); a native born Portuguese who emigrated to
Brazil, often as a **caixeiro** (Oliveira Martins, 1891:248), made his
fortune and returned to his home village to display his success by,
for example, building an ostentatious house for himself and his new
bride - his childhood sweetheart. Popular thought was that every
peasant family produced at least one **Brasileiro** (Brettell, 1979;
1986:80)[84].

Of course, some of the return migrants were already married when
they initially left Portugal. "While their husbands were gone, the
women of northern Portugal, especially those from the Province of
Minho, customarily dressed themselves in black and eventually earned
themselves the epithet **viuvas dos vivos** (widows of the living)"
(Brettell, 1986).

The myth of fortune and return still persists today in the form
of Portuguese emigration to France and, to a lesser extent, Germany.
The **Brasileiro** of the nineteenth and early twentieth century is
becoming the **Francês** of the late twentieth century. These
contemporary migrants differ from their earlier counterparts in two
main ways. First, they often take their families with them. Second,
the ideology of return, prompted by **saudade** (profound melancholy and
longing for something past), is seldom practised, because emigrants
rarely live as well in France as they would have their relations and
friends in Portugal believe. They therefore enjoy more admiration

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[83] Cited by Godinho (1978:18).

[84] A typical **Brasileiro** can be found in Luís de Magalhães' **O Brasileiro Soares**, but see Benis
(1981) for a complete discussion of the popular image of the **Brasileiro**.

and respect by extending their temporary migration than they would if they permanently returned (Brettell, 1979; Antunes, 1981). This phenomenon is not peculiar to Portugal, but a common symptom of recent intra-European labour migration.

The difficulties of estimating return migration, being less than those of estimating clandestine emigration, have resulted in a series of relatively reliable figures in the literature. However, the figures suffer all the drawbacks outlined in Section 2.3, usually being based on numbers of gross arrivals, including non-Portuguese and Portuguese returning only temporarily. More importantly, they are not directly related to the emigrant cohorts from which they were drawn, and are therefore not true proportions of ultimate return[85]. Also, the characteristics of return migrants are usually unavailable, making it impossible to differentiate between unsuccessful emigrants and successful return migrants[86]. Nevertheless, some suggested levels are presented in Table 2.7.

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[85]Unfortunately, there has been a tendancy among Portuguese scholars to represent return migration levels by calculating ratios of departures to arrivals of Portuguese citizens at Brazilian ports during one-year calendar periods; this approach would only be justified if return migrants were generally seasonal migrants travelling to and from Brazil within the same calendar year. For example, Serrão (1976c) presents such figures with respect to several ports of Brazil during the nineteenth century, leading himself to the meaningless and considerably misleading conclusion (:103) that "periods of high emigration coincide with periods of low return".

[86]Of course, there will have anyway been a tendency for return migrants to comprise a self-selected group, to the exclusion of unsuccessful emigrants who were simply unable to accumulate the necessary funds.

Table 2.7a Evidence of Return Migration Levels

Period	Number	Level (%)	Date of Source	Source
1864-1872		30-40	1976	Halpern Pereira (1981:33) cites Serrão (1976c:99-104). No method of estimation is given.
	2,500	37	1873	First Parliamentary Inquiry of Emigration (:42); it is noted that this estimate includes repeat-migrants.
		40	1873	Morais draws a dramatic illustration of return migration, writing that of every 100 emigrants, 40 come back; 20 poor and unhealthy, 15 with a few savings, and only five with good fortunes.
1870-1874	2,950	39	1875	**Documentos Apresentados às Cortes na Sessão Legislativa de 1875: Emigração Portuguesa** - the mean annual number of Portuguese leaving Rio de Janeiro during the period; of these, 90% payed their passage, and 10% were described as **indigentes** (destitute). Again, this includes repeat-migrants. Cited by Serrão (1980).

Table 2.7b Evidence of Return Migration Levels

Period	Number	Level (%)	Date of Source	Source
		≤50	1891	Oliveira Martins (:246) suggested that of, say, 14,000 emigrants in one year, the number of unsuccessful repatriates would sometimes be as high as 7,000. Cited by Arroteia (1983:19).
		15	1902	Andrade also includes repeat migrants.
1913	20,918	5	1916	Carqueja (:415) compares these figures with the number of departures in the same years: 67,821 and 26,216, respectively; he notes that, clearly, the only truly meaningful measure would be the proportion who ultimately return.
1914	29,418	6		
1919-1930		3.5	1971	Evangelista (:159). Cited by Serrão (1974:39).
1940-1968		6.8	1968	Estatísticas Demográficas (:113) - annual numbers of repatriates. Cited by Serrão (1974:39).

Note: (1) Where numbers have been illustrated with percentage levels (in brackets), the percentage is calculated as the number divided by the mean number of emigrants in the ten years preceding the last year to which the number relates.

(2) Because there was a tendency for emigrants to adopt the Brazilian nationality, the number of **Brasileiros** on the 1890 census might be taken as an indicator of return. The data show that of the 5,307 present in mainland Portugal on 1 December, the highest District totals were; Porto 1,916, Lisboa 1,750, Braga 450, and Viana 238.

Compared with the European figures of return migration presented in Section 2.3, return migration to Portugal from Brazil presents a sharp contrast. The trend in the rate of return was a decrease over time, accompanying the decrease in the proportion of emigrants departing individually; as more and more family units were departing permanently, a smaller proportion of all emigrants returned. Of more importance however, is the contrast in the levels of return migration. Portugal, with its myth of fortune and return, appears to have experienced less return migration than many northern and western European countries. There are two main reasons for this. First, there was no southern Atlantic labour market embracing Portugal and Brazil, akin to that of, for example, Sweden and the U.S.A. in the North Atlantic. Second, the agrarian myth of, for example, Great Britain was less of a myth in Portugal, and some other Mediterranean countries, where a modest rural exodus did indeed occur in the late nineteenth and early twentieth centuries. The belief that levels of return migration were higher in Portugal than in most northern European countries is therefore best attributed to its importance in Portuguese folklore.

Nevertheless, Portugal's fragile economy of the nineteenth century, came to rely heavily on the income generated by the remittances and return of its emigrants[87]. Emigrant remittances are discussed in Section 2.7.4; here, all that can be said of capital brought back by return migrants is that very little is known. In fact, the impact of return migration, particularly Portuguese return migration, is an area of great uncertainty, and consequently, current debate in the study of migration

First, the distribution of the amount of capital brought back by return migrants is unknown - though the estimates from **Documentos Apresentados às Cortes na Sessão Legislativa de 1875: Emigração Portuguesa** suggest that the proportion of return migrants who were destitute, unsuccessful emigrants, bringing back no capital at all, was small.

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[87]For example, in 1846 the government debt stood at 71,000 **contos** (150 million U.S. dollars), of which more than half was external debt - "a staggering amount for a poverty-ridden little country!" (Livermore, 1947:427; cited by Nowell, 1952:196).

Second, the effects of these capital sums on the Portuguese economy is unknown. On the one hand, it is suggested that the capital of return migrants stimulates the economy. For example Feijó (1983:340) suggests that it is likely that the region of Viana followed a similar pattern to that described for Galicia by Villares (1982); agricultural development was not a result of liberal reforms, but it began to gather momentum at the very end of the nineteenth century and beginning of the twentieth century, with the availability of a new source of funds - the capital generated and injected into the economy by return migrants - the **Brasileiros**. On the other hand, it is suggested that the capital of return migrants does not stimulate the economy. For example, Brettell (1979) suggests that return migrants, perhaps preoccupied with gaining the respect of their community, often prefer to use their capital in ways which do not stimulate the economy[88], and perhaps even hinder its development by, for example, sustaining inefficient agricultural practices[89].

In conclusion, the literature adopts a historical-structural perspective rather than the functionalist-equilibrium models of return migration[90]. As argued throughout this Chapter, this perspective is unsatisfactory. With respect to Portuguese return migration, the historical-structural perspective merely raises questions such as why so many individuals left with no intention of returning. The hypothesis that these were all victims of the ideology of return migration, who found it socially (and perhaps economically) advantageous to stay away, is simply not tenable.

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[88] For example, the frequently-discussed construction of an ostentatious house.

[89] Rhoades (1979) discusses very similar processes of contemporary return migration from Germany to several Andalusian (Spain) villages. He concludes that migration has not fed opportunities back to sending regions, but has rather perpetuated more emigration.

[90] See Wiest (1979) for a description of functionalist-equilibrium, and historical-structural models of return migration in anthropology.

2.7.4 Emigrant Remittances

Remittance levels are closely associated with levels of return migration; it is generally assumed that remittances accompany an intent to return (Wiest, 1979:170). As described in Section 2.7.3, Portugal's fragile economy of the nineteenth century came to rely heavily on the income generated by the remittances and return of its emigrants. Between 1850 and 1930, emigrant remittances formed an important contribution to Portugal's balance of payments, and stimulated investment in Portugal (Halpern Pereira, 1981:43)[91]. At the beginning of that period, Carlos Morato Roma (1852:46-47) remarked on the considerable number of entries of a regular nature into Portugal from Brazil in the form of goods, gold, credits, and profits from foreign investments[92].

The difficulties of estimating remittances are far greater than those of estimating clandestine emigration or return migration; as Luíz d'Almeida e Albuquerque (1897:143) points out, many remittances came to Portugal from Brazil via the financial institutions of London rather than Lisbon, as this route was cheaper. Nevertheless, levels of remittances which have been suggested in the literature are presented in Table 2.8.

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[91]Luíz d'Almeida e Albuquerque (1897:143) notes how much foreign investment in Portugal, especially to the north of the Mondego River (flowing through Coimbra), stemmed from Brazil.

[92]Cited by Godinho (1978:27).

Table 2.8 Evidence of Remittance Levels

Period	Contos	Date of Source	Source
	3,000	1873	Herculano - it was this figure that prompted him to conclude that "O Brasil é a nossa melhor colónia, desde que deixou de ser colónia nossa" - an observation frequently cited.
	13,500	1885	Moutinho (:65). Cited by Halpern Pereira (1981:36).
	>10,000	1890	Guimarães (:10). Cited by Halpern Pereira (1981:36).
	12,000-15,000	1891	Oliveira Martins broke this figure down into: 5-6,000 from merchants, who only brought home enough to cover their immediate expenditure while leaving the rest of their fortunes in Brazil; 2,000 sent by the investors of Rio de Janeiro and other cities; and 2-3,000 in other forms such as monthly payments, presents, etc., sent home by emigrants working in Brazil.
	10,000-15,000	1896	Cordeiro. Cited by Simões (1934:48).
1903-4 1904-5	5,753 7,530	1911	Costa (:128). Cited by Garrido (1920:35).
1911	3,113	1917	Silva (:105) suggests that at the time of writing, a more accurate estimate would lie between 24,000 and 32,000 contos.

Note: (1) None of the authors give their method of estimation.
(2) The conto was the word used for one million reis, the nineteenth century unit of Portuguese currency; the conto is now equivalent to, and used for one thousand modern escudos.

The most striking feature of the figures is their increase in the last quarter of the nineteenth century, and their subsequent decrease in the first quarter of the twentieth. Once again, the decrease is probably associated with the decreasing proportion of emigrants departing individually; for example, Andrade (1902:333), discussing the connection between planned return migration and the level of remittances, expresses great concern at the increase in emigration of whole families.

A distribution of remittances sent in 1900 through financial institutions from Brazil to Portugal is presented by Halpern Pereira (1981:46). Unfortunately however, the distribution cannot be considered as typically representative. First, it is expected that the level of remittances was particularly high in 1900, since that year falls in one of the only periods during which exchange rates have moved in Brazil's favour. Second, the fact that most remittances came from the São Paulo Province of Brazil might well be partly associated with a fall in the levels from the City of Rio de Janeiro - which suffered a collapse in commerce in the years 1896 and 1897. Also, the fact that most remittances were sent to men in Portugal, not to women, probably to some extent merely reflects the legal status of women. Nevertheless, the distribution does show that just two districts of Portugal received almost 75% of the total: Porto, 53%; and Braga, 21%.

The figures in Table 2.8 might be compared with those witnessed more recently: 1.5 million **contos** in 1958, increasing to 4.8 million **contos** in 1966 (Serrão, 1974:176). In fact, between 1950 and 1970 remittances amounted to twice Portugal's income from tourism (Ferreira, 1976), and accounted for as much as 12% or more of Gross National Product, affecting the strategies of government, investment funds, banks, industry, and agriculture, with feedback effects on the patterns of emigration choices at the household level (Leeds, 1979:403). The impact of these more recent remittances has been studied using Social Accounting Matrix impact models. Cravinho (1981a, 1981b), and Ferreira et al (1982), conclude that, so far, emigrants remittances have only indirectly contributed to the development of Portugal since "... few emigrants have invested their money directly in the creation of production units". Furthermore, studies by Amaral (1982), and Seruya (1982), show that the more

developed regions have so far benefited most, and conclude that dynamic regional policies could obtain considerable results[93].

In conclusion, a little more is known about the impact of emigrant remittances than about the capital brought back by return migrants.

2.7.5 Portuguese Emigration in a European Context

One of the most striking features of the preceding review of the literature is that Portuguese emigration, especially during the nineteenth century, is rarely compared with the flows of emigration that were being experienced throughout Europe.

A few authors, however, do compare the levels of emigration from different countries. Andrade (1902) compares the rates of emigration from several European countries, concluding that Portugal had one of the highest rates per thousand population, "higher even than England", and only exceeded in Switzerland and Norway. Carquejo (1916:395), defining "emigrability" as the number of emigrants per thousand population, compared emigration from Portugal with that from Ireland during the three periods 1871-5, 1896-1900, and 1902-6, calculating that the Irish rates were 4.4, 2.4, and 2.8 times the Portuguese rates, respectively. He also calculated (1916:413) that, at the time, Portugal's population loss through emigration was less than the reduction of Ireland's population from 8.2 to 4.4 million between 1841 and 1907, and less than the 40% reduction in the population of the United Kingdom in just 17 years (unfortunately, he does not report which 17 years he is referring to). He concluded that "emigrability" was highest in Holland, Ireland, Italy, Scotland, the United Kingdom and, of course, Portugal.

Considering the differences between emigration from Portugal and the rest of Europe. Emigration from Mediterranean Europe escalated later than that from northern and western Europe, but continued to increase well into the twentieth century (Serrão, 1974:54-55). Even very recently, with the majority of Mediterranean emigrants travelling to the industrially advanced countries of northern Europe,

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[93]Cited by Ferreira de Paiva (1983:142-3).

trans-Atlantic migration, albeit to a lesser extent, has continued; as recently as 1972, more than 10,000 Portuguese emigrated to the U.S.A., only outnumbered by Italians and Greeks (Davis, 1974:102).

In conclusion, a broad comparison of the characteristics of the Portuguese emigrants with those of other European countries illustrates that Portuguese emigration possessed some unique features. First, emigrants were predominately male until relatively recently. Second, in the nineteenth century, a large proportion of these male emigrants were young - often under 14 years old. Third, the proportion of emigrants departing individually was decreasing in Portugal, while it was increasing throughout most of Europe. At the same time, while the extent of return migration increased elsewhere, in Portugal it decreased.

2.8 Summary

The explanations for the emigration from Europe of between 44 and 52 million people during the century between the end of the Napoleonic Wars and the outbreak of the First World War lie in the expansion of the European economy through enormous technological achievements, which brought with them a drastic reorganisation of employment patterns.

With respect to Portugal, over the last 500 years, emigration has played an integral part in the evolution of the demographic structure of the country. During the last 100 years or so, emigration from Portugal reached levels surpassing those of most other European countries, and the country registered a net population loss second only to that of Ireland. However, while "the importance of emigration in Portuguese literature is a reflection of its importance in Portuguese life" (Brettell, 1986:6), the quantitative importance of Portuguese emigration in a broader context has not been adequately reflected in the international literature.

In comparison with the literature of European emigration, even the work of contemporary Portuguese scholars tends to be rather poor. Essentially, this is because there has hitherto been a heavy reliance on anecdotal information, and a (closely associated) tendency to assume the historical-structural perspective of migration, thereby avoiding any detailed (quantitative) analysis.

Many of the issues in European emigration have not even been approached with respect to Portugal. Data, although sparse, do exist, even if not in a ready form. Passport statistics survive in the district archives, and quantitative demographic and economic data, though of a relatively poor quality, also exist. These sources need to be exploited in the fashion of recent detailed studies of emigration from other European countries - notably those of the Scandinavian and British emigrations. Until truly cross-national studies of Portuguese emigration are available, its unique features will not be fully understood.

The detailed identification of the process of emigration has remained largely speculative because of the lack of systematically collected statistics. Nevertheless, the strong association of early emigration with commerce, and the later exodus with the system of agriculture practised in the north-west of the country, have remained

a central theme, corroborated by a vast amount of anecdotal information, and some quantitative evidence.

More generally, emigration has been a persistent phenomenon; in some areas even now, "... by far the most important economic activity after agriculture - and in terms of overall household income certainly the most significant - is emigration" (Pina-Cabral, 1986:20). Considering the effects of this phenomenon, it is worth quoting the conclusions of Swanson (1979:53), who reviews the literature on the consequences of emigration for economic development: "while emigration may secure a more adequate standard of living for at least some migrants and their families, it is rarely a solution for the problems of national impoverishment. Indeed, emigration often permits political and economic systems to avoid coming to grips with basic insufficiencies and inequities in their organisation".

In this context, the history of nineteenth century Portugal has been scrutinised in search of missing evidence. It is generally agreed that the Liberal Revolution proved disappointing, though as Reis (1987:252) describes, opinions differ as to the reasons for the Liberals' failures; many authors (Godinho, 1955; Macedo, 1963; Halpern Pereira, 1970; Villaverde Cabral, 1976; Mendes, 1980; Reis, 1984) stress the political and economic dependence of Portugal on foreign powers, especially Great Britain; some (e.g. Silbert, 1972) stress the economic complacency inherited from the earlier abundance of gold; and others (Godinho, 1975; Serrão & Martins, 1978) lay more importance on internal social and institutional factors. Although the theories differ as to the causes, there is agreement that the slow progress of the Liberal Reforms had disastrous effects on the development of the Portuguese economy.

In conclusion however, it is clear that until a more complete understanding of the nature and extent of clandestine, return, and repeat emigration, and emigrant remittances is achieved, some of the major issues concerning Portuguese emigration, and its relatively unique position within the larger puzzle of the European emigrations will remain unresolved.

CHAPTER 3

EMIGRATION FROM THE ALTO MINHO

3.1 Introduction

Traditionally, the Alto Minho (the District of Viana, Minho, Portugal), has been seen as one of the main sources of Portuguese emigrants, particularly of those who submit to the ideology of return migration - sending money home while abroad, and hoping one day to return and display their success. Still today, "... by far the most important economic activity after agriculture - and in terms of overall household income certainly the most significant - is emigration" (Pina-Cabral, 1986:20). Indeed, it is suggested that "emigration in north-western Portugal has preserved small inheritances and avoided total penury" (Brettell, 1986:263).

The purpose of this Chapter is to identify changes in the level and structure of emigration from the the Alto Minho, during the second half of the nineteenth century in order to gain some insight into the origins of this tradition.

This is achieved through an investigation of emigrant characteristics, as available from passports issued, and a comparison of these characteristics with those of the population from which the emigrants were drawn.

The analysis is supplemented by the application of a simple model of population change which enables the extent of clandestine emigration to be investigated.

Finally, the quantitative evidence presented here is compared with the largely anecdotal evidence on which the study of Portuguese emigration has hitherto relied.

In order to achieve these aims, it is necessary to establish the conjuncture of emigration from the Alto Minho. The analyses are therefore preceded by a detailed description of the area under consideration, focusing on the important economic and demographic characteristics of the District.

3.2 The District of Viana

The administrative divisions of Portugal were completely reorganised with the radical liberal reforms of 1835. Since then, the principal administrative unit has been the district (**distrito**); a system of division which does not directly correspond with the division into provinces. There are now 18 districts in Portugal, of which Viana (the Alto Minho), is the northenmost. Each district comprises of boroughs (**concelhos**), which, in turn, are made up of groups of parishes (**freguesias**). The subdivision of the District of Viana do Castelo has remained unaltered since 1855.

The Minho Province comprises three districts: Viana, Braga, and Porto. The District of Viana, the northernmost of Portugal, is shown in Figure 3.1. As can be seen, it is bordered by the Galician provinces of Pontevedra to the north and Orense to the east; and the Portuguese district of Braga to the south. The District is divided into 10 boroughs: Viana, Arcos de Valdevez, Caminha, Melgaço, Monção, Paredes de Coura, Ponte da Barca, Ponte de Lima, Valença, and Vila Nova de Cerveira. Of these, the most populous during the nineteenth century were Viana, Ponte de Lima, and Arcos de Valdevez. The **de facto** and **de jure** populations of the District given by the census of 1890 were 207,366 and 213,600 respectively, which can be compared to the figures for mainland Portugal of 4,660,095 and 4,713,319.

The Ancien Regime **Comarca** of Viana do Minho was part of one of the most developed and prosperous regions of Portugal at the beginning of the nineteenth century (Feijó, 1983:11). With the administrative reforms of 1835, almost all the land of this **Comarca** became the District of Viana do Minho, whose name was subsequently changed in 1848 to Viana do Castelo[1].

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[1] The change of name accompanied the elevation of the Town of Viana to the category of **cidade** (city); the change was associated with the role played by the Town's small castle during the Patuleia War (1846-1847) (Feijó, 1983). With respect to the Town/City, some confusion is unavoidable here - where it is referred to in periods before, spanning, or following the year 1848, it will be referred to as the Town, Town/City, and City of Viana, respectively.

Figure 3.1 The District of Viana
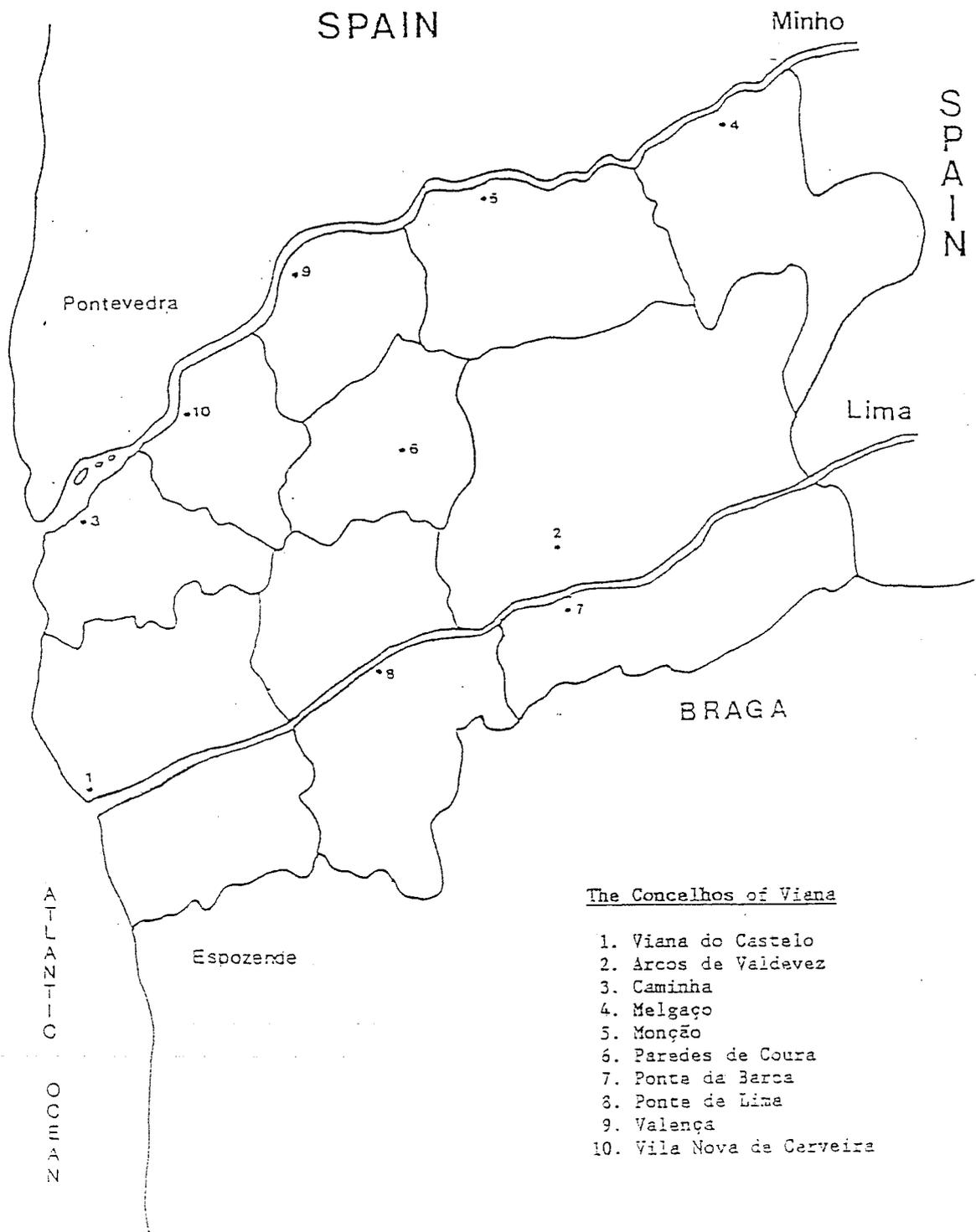
SPAIN

Minho

S P A I N

• 4

• 5

Pontevedra

• 9

Lima

• 10

• 6

• 3

2
•

• 7

• 8

BRAGA

A T L A N T I C   O C E A N

Espozende

The Concelhos of Viana

1. Viana do Castelo
2. Arcos de Valdevez
3. Caminha
4. Melgaço
5. Monção
6. Paredes de Coura
7. Ponte da Barca
8. Ponte de Lima
9. Valença
10. Vila Nova de Cerveira

3.2.1 Agriculture of the District of Viana

During the nineteenth century, the District of Viana, like most of Portugal, remained heavily dependent on agriculture, seeing little of the industrial revolution that was sweeping through many areas of Europe. The District relied on the **minifundia** economy, characterised by the extreme fragmentation and dispersion of property which still prevails throughout north-western Portugal today. The main agrarian products were: maize, wheat, rye, barley, beans, cabbage, onions, oranges, lemons, honey, wine, olives, and flax; cattle were reared, and pigs and poultry were kept in the vicinity of the houses. Of these, maize, wine and cattle were the most important export products. The only other primary product of the District was fish, Coelho (1861:17) records that there were 293 sea fishermen in the District (73% in the Town of Caminha; the rest in the City of Viana) and 1,187 river fishermen (98% of which fished the Minho River, the rest fishing the Lima). There were very few landless peasants, and most of the population therefore survived from subsistence farming, only supplemented by cash crops when immediate household needs had been met. In this way, the district's labour market was restricted, and a lack of employment opportunities for young members of peasant households prevailed (Feijó, 1983: 230-242).

Maize, introduced in the sixteenth century, accounted for almost 90% of the agrarian production of the District; by 1860, 25% of the annual production of this crop was being exported, providing for about 70% of all imports. This heavy reliance of the District's economy on maize suggests that the mean annual price of maize between 1810 and 1900 shown in Figure 3.2 (data in Appendix 3.A) may provide an insight to the economic conditions of the District as a whole. In fact, the maize price series is not atypical; for example, Steele (1988) finds the prices of maize and rye to be highly correlated. Since much of the population survived on subsistence farming, and did not participate in a cash economy, extremely high prices will indicate relative scarcity while very low prices will not only indicate abundance, but also a poor return from exports and therefore a shortage of funds with which imports could be purchased.

Figure 3.2 The Price of Maize in Viana, 1810-1900

YEAR
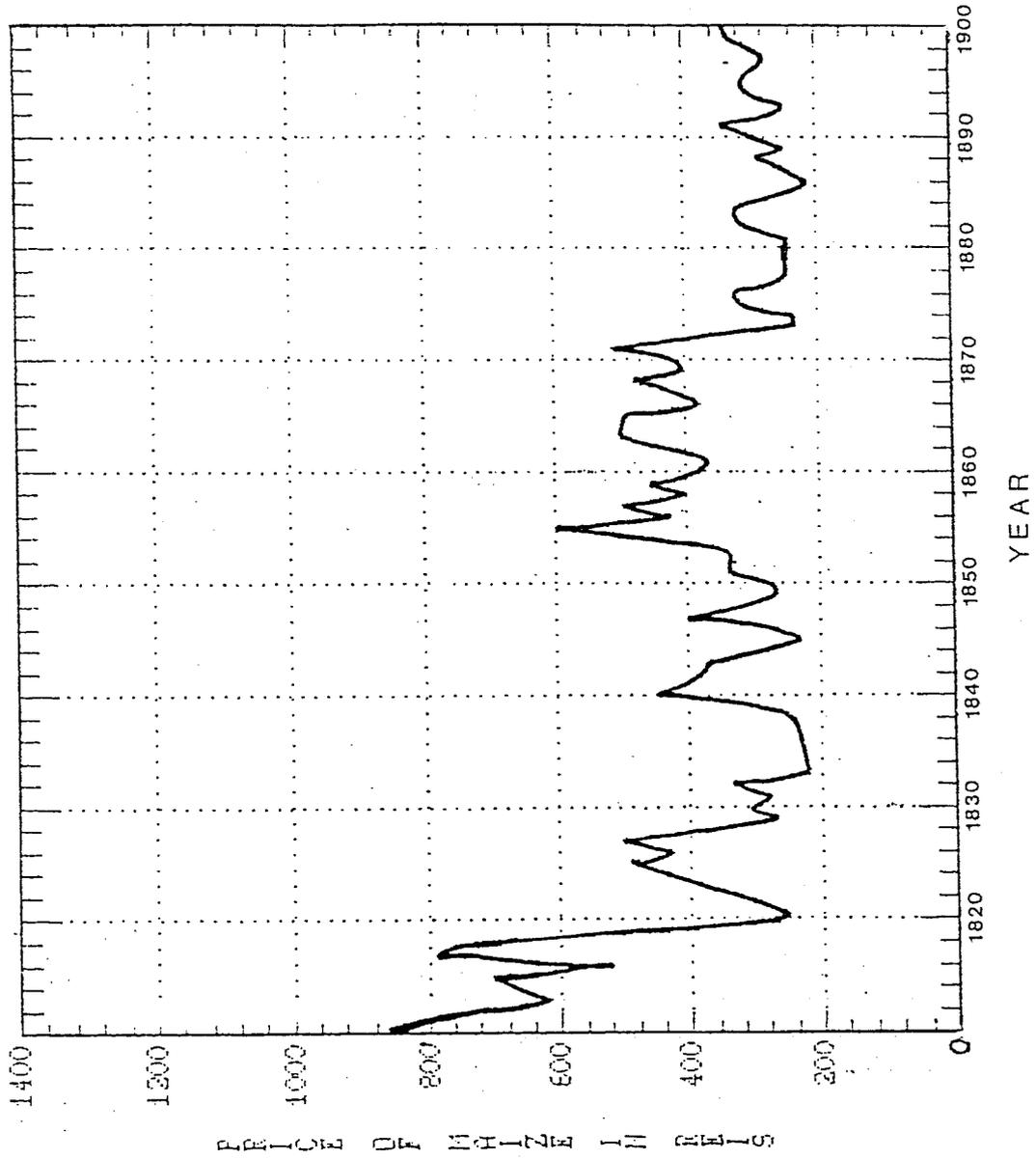
Source: Actas da Câmara, Archivo Municipal de Viana do Castelo

The Figure shows that the levels of maize prices seen during the French invasions of 1807, 1809, and 1810, were not seen again throughout the rest of the century. On the other hand, internal conflicts during the turbulent first half of the century[2], which presumably interrupted exports, can be seen to mark minima of the price fluctuations. The highest post-1820 peak occurs in 1855, following the poor harvest of 1854 and also the year in which an outbreak of cholera swept the District, while the highest in the last quarter of the century is in 1891, the year following the beginning of a national agricultural and commercial crisis which lasted throughout the 1890s[3]. The deflation of prices in the last thirty years of the century is attributed to competition from the cereal exports of other countries, especially wheat from the United States.

Of particular interest with respect to agrarian produce is the notable absence of the potato. Introduced to Portugal at the end of the eighteenth century, the potato caught on very slowly and was only produced in every borough of the District of Viana by about 1870; more than 20 years after the failure of the same crop, the staple diet of millions, had caused unprecedented levels of emigration from many parts of northern Europe.

Changes in the concept of property in Portugal were introduced from the time of the Marquis de Pombal (1750-1777) until the final reforms of the Civil Code of 1867. Partition of the commons was mostly completed by the time the **Cadastre** of 1829, designed to increase municipal revenues and to forestall the technically illegal occupation of common lands by legalising past occupation, was drawn up. The subsequent new reforms of the 1860s, allowing contracts to be redeemed for the payment of 40 times the annual **foro** (rent), however, were only exploited by about 15% of those eligible - mostly

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[2] The Revolution of 1820, the Civil War of 1828-1834, the Septembrista movement of 1836, and the rising of Maria da Fonte (1846) and Civil (Patuleia) War of 1846-1847.

[3] Portuguese agriculture, whose progress had been impeded by the disorganisation of property and the high cost of credit, proved unable to compete in the growing international market (Guimarães, 1890:205); wine production in the Douro valley was particularly affected by phylloxera, a threat that grew steadily through the 1880s reaching almost every district by 1887 (**A Aurora do Lima**, 23 February, 1887) and heavy competition, especially from France (Brito, 1889). More directly, the crisis of 1890 is attributed to the closing of British and French markets to Portuguese agricultural produce and cattle exports (Halpern Pereira, 1979:139).

the wealthy. The sale of crown and church properties[4] (partitioned into as many small plots as possible) in 1835 and 1836, which was intended to generate enormous income with which debts were to be payed, is also deemed to have benefited a meagre number of already wealthy landowners. In fact, in the District of Viana many of the purchases were made by a handful of residents of the Town of Viana who appeared on its muster-rolls and electoral registers. In addition, the theory, promoted by the first parliamentary inquiry of emigration and subsequently adopted by modern authors (Halpern Pereira, 1983:340-349; Villaverde Cabral, 1976:230), that the District was undergoing further fragmentation during the nineteenth century is more recently refuted (Feijó, 1983:143;163), on the grounds that restrictions on fragmentaion, imposed by the **vínculos**[5] and emphyteutical lease[6] system of land tenure and actively adopted in the inheritence patterns of the population, successfully prevented this. Nevertheless, in conclusion, the land reforms, blind to the fact that the land problems of the Minho lay in the system of tenure rather than the system of ownership, were unsuccessful, benefiting the relatively wealthy at the expense of the rural peasantry (Feijó, 1983:168-227). In short, the land reforms failed in their intention to open the way for the development of capitalist agriculture (Pina-Cabral, 1986).

With these points in mind, Feijó (1983:340) suggests that it is likely that the Borough of Viana followed a similar pattern to that described for Galicia by Villares (1982). Agricultural development was not a result of liberal reforms, but it began to gather momentum at the very end of the nineteenth century and beginning of the twentieth century, with the availability of a new source of funds - the capital generated and injected into the economy by return migrants - the **Brasileiros**.

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[4]The church properties became national assets after the Law of 30 May, 1834 disbanded all religious orders.

[5]**Vínculos** were assets which could not be leased, sold, or divided among heirs, and which were necessarily transmitted under constant conditions to the eldest male descendent.

[6]The emphyteutical system of land tenure involves the division of the rights to a plot of land into two: the right to possess; and the right, usually on the payment of a rent, to cultivate.

3.2.2 Population of the District of Viana

The population of the District grew slowly during the nineteenth century. This is documented by data from two books of population statistics for the District of Viana, compiled for the periods 1837-1867, and 1869-1890 (District totals are reproduced in Appendix 3.B). With respect to these population statistics, Halpern Pereira (1970) points out that there is a slight under-registration of births since non-Catholics, and sometimes infants dying soon after birth, were not baptised. Further, she warns against too much reliance on the official tables of population movement from which these data are drawn. Nevertheless, the total annual population of the District between 1837 and 1890 is shown in Figure 3.3. The larger fluctuations of the first decade - a turbulent period of political instability which includes the civil war of 1846 and 1847 - are thereafter replaced by a steady gradual increase. Also, crude fertility and mortality rates are shown in Figure 3.4. However, beyond suggesting approximate levels the large fluctuations do not allow any particular trends to be identified. The fluctuations are far too large to be attributed to random variation, and therefore substantiate the reservations of Halpern Pereira.

The District's slow growth during the nineteenth century, slower than that of the rest of the country, can be attributed to its lower levels of fertility and high levels of emigration, only slightly counterbalanced by the lighter mortality experience of the District. Table 3.1 shows the **de facto** populations of the ten boroughs of the District at each of the four census enumerations taken during the second half of the nineteenth century.

Table 3.1 The Population of the District of Viana, 1864-1900

Borough	Census Year			
	1864	1878	1890	1900
Viana	42,792	43,410	44,731	45,768
Arcos de Valdevez	29,147	30,957	30,423	31,683
Caminha	13,241	14,882	13,571	14,697
Melgaço	14,640	15,859	14,488	14,956
Monção	22,367	24,409	24,049	25,155
Paredes de Coura	12,463	12,750	12,147	13,048
Ponte da Barca	12,379	12,461	11,954	12,758
Ponte de Lima	32,351	32,033	32,071	33,130
Valença	15,044	15,373	14,412	14,716
Vila Nova de Cerveira	10,255	10,416	9,520	9,356
Total	204,679	212,550	207,366	215,267

Figure 3.3 The Population of the District of Viana, 1837-1890
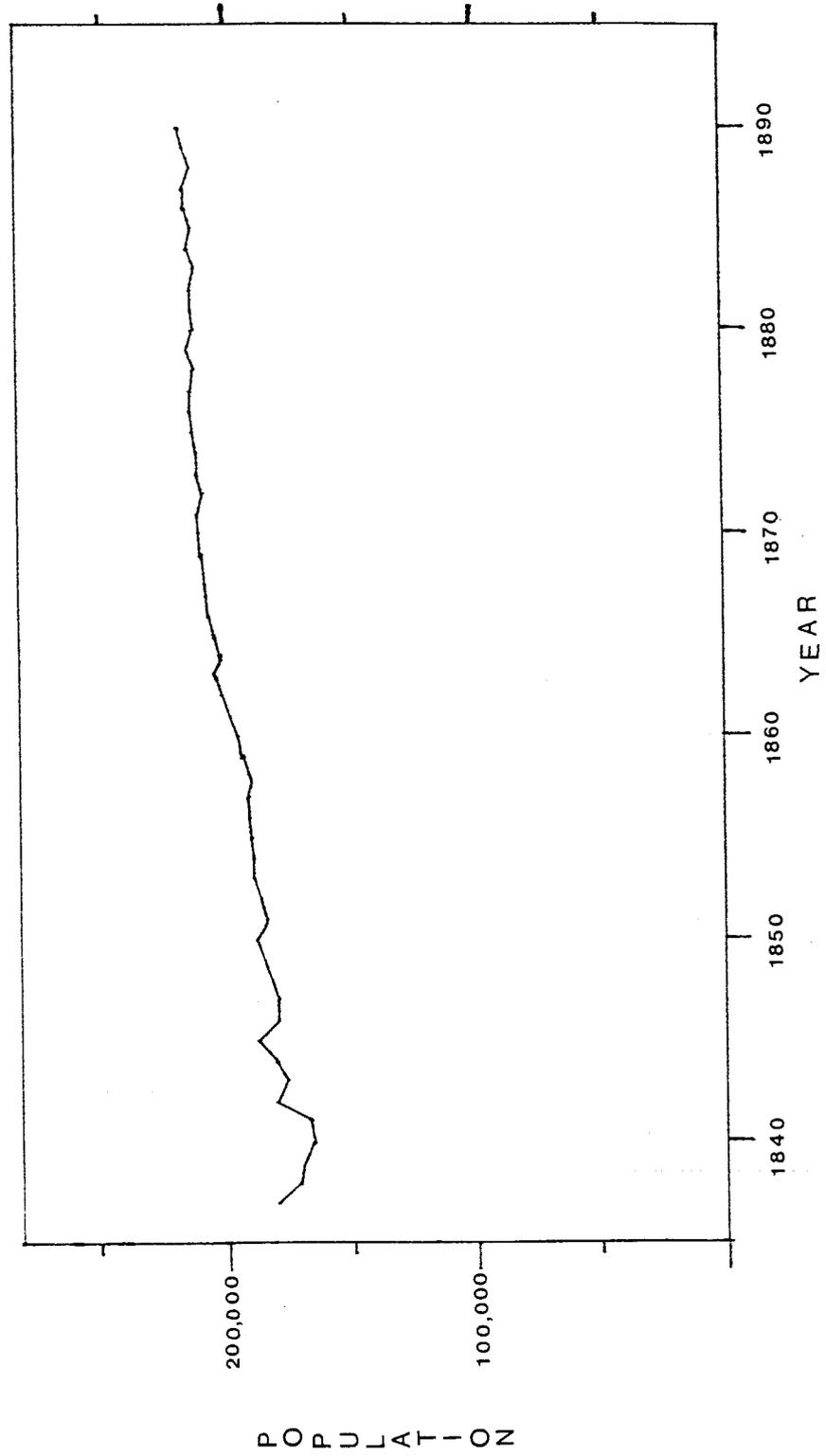
Figure 3.4 Crude Fertility and Mortality Rates, District of Viana, 1837-1890
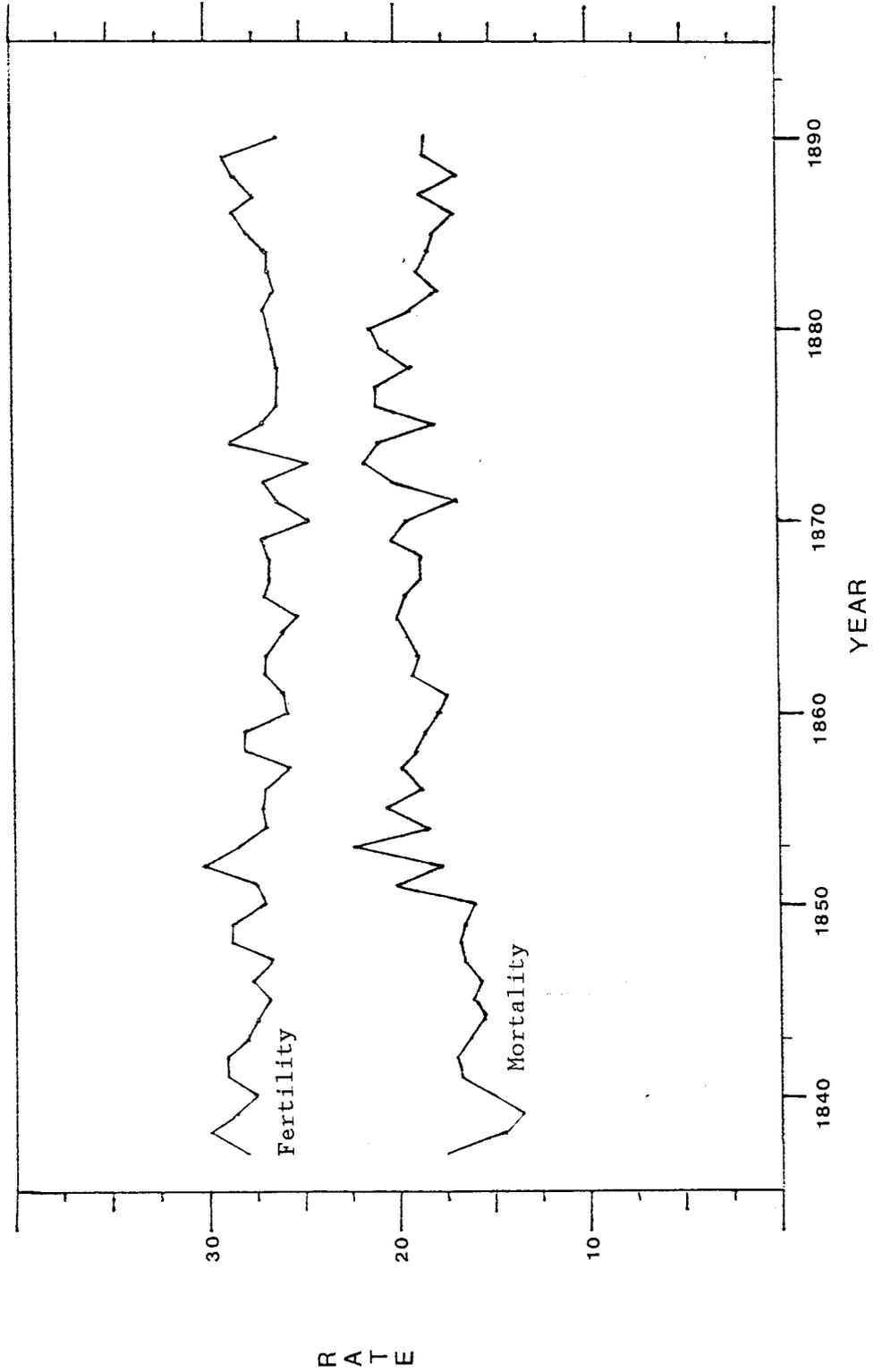
From these data, Sampaio (1979) identifies the Borough of Ponte de Lima as having experienced particularly high levels of emigration between 1864 and 1878, since it was the only one that exhibits a decrease in population during that period. On the other hand, between 1878 and 1890 the population of Ponte de Lima hardly changed, while that of almost every other borough decreased markedly. Only the Borough of Viana exhibits a significant increase in population during the same period, as it does in each of the inter-censal intervals. These increases cannot however be attributed solely to rural-urban migration to the City of Viana do Castelo, since the population of the City was 9,263, 8,816, 9,682, and 10,092 at the four censuses, respectively. Between 1890 and 1900 all the boroughs again experienced a rise in population, with the exception of Vila Nova de Cerveira which showed a slight decrease.

An insight into household structure in the District can be gained from the study of Feijó (1983:123-143), who, working with muster-rolls drawn up between 1826 and 1833[7], finds that the levels of complex households (approximately 20% - minimum) and simple households (approximately 60% - maximum) lay closer to those of southern Portugal (or the Mediterranean in European terms) than to those of Atlantic Europe with which the north-west of Portugal has often been associated. The levels of complexity are explained by the relatively light mortality, and trends in the family cycle which can be characterised by marriage in the late twenties, followed by residence in a multiple family household[8] which subsequently becomes simple again as mortality removes its eldest members, and remains so until the couple's own offspring later marry.

The mobility of the population may initially be gauged from the figures presented in Table 3.2, which show the birthplace of the population of the 1890 census resident in: a) the borough in which they were born, b) another borough of the same district, c) a different district of Portugal; and d) the number born in another country.

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[7]Feijó examines muster-rolls from the following seven parishes of the Borough of Viana: Abelheira, Amonde, Âncora, Carreço, São Lourenco, Santa Marta, and Serreleis.

[8]Data indicate that male marriage into a female's household and female marriage into a male's household were equally likely.

Table 3.2 Birthplaces (%) of the Population, 1890

Administrative Area	Same Borough	Same District	Other District	Other Country
Portugal	89.0	4.2	6.0	0.8
Viana (District)	94.6	2.9	1.8	0.7
Viana (Borough)	92.2	3.6	3.5	0.7
Viana (City)	71.2	13.0	13.0	2.8
Porto (City)	55.7	12.3	27.9	4.1
Lisboa (City)	50.6	8.8	35.2	5.4

Although the figures may to some extent be affected by emigration differentials, they suggest that the population of the District of Viana was less mobile than that of the whole country. However, as the area considered is reduced to the Borough of Viana, and then the City itself, mobility increases significantly, especially as it is to be borne in mind when examining the attraction of the City of Viana in comparison with Porto and Lisboa, that the populations of the three cities were at the time about 10, 140, and 300 thousand respectively.

The foreigners present in the District of Viana when the census was taken were (with those of the Borough in brackets): 1,280 (204) Spanish, 238 (88) Brazilian, 27 (14) French, 11 (4) English, 8 (6) Italians, and 14 (1) others. It is particularly interesting to note that the Brazilians are distributed fairly evenly over the whole District, since it is known that emigrants often adopted the Brazilian nationality while there, retaining this national identity upon their return to Portugal[9].

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[9]The Brazilian Decree that all those foreigners resident for more than two years in Brazil were to be considered as Brazilian unless they declared otherwise (1890) ensured that the number of naturalised Brazilians was maximised.

3.2.3 Technological Development of the District of Viana

As mentioned in Section 3.2.1, the District of Viana, like most of Portugal, saw little of the industrial revolution that was sweeping through many areas of Europe[10]. Also, the proportion of people living in urban areas did not change significantly during the century (Feijó, 1983:103). Communications in the District also developed very slowly, remaining heavily dependent on the Lima and Minho rivers which were navigable by small boat, and the few roads that already existed, until the railway from Porto reached the City of Viana in 1878 and the border town of Valença eight years later in 1882. Most internal commerce was therefore centred around the two rivers, while external commerce was based in the principal port of the District - the City of Viana - and the second port - Caminha (Feijó, 1983:234-237).

3.2.4 Summary

The description of the District of Viana presented in this Section highlights the inertia of the District's agriculture, economy, and population during the nineteenth century. Of the three, agriculture, characterised by the extreme partition of property and subsistence farming, was most reponsible, governing the lives of the vast majority of the population. Costa (1928), discussing these same issues, concludes that the system of agriculture of the Minho was an obstacle to the development of agricultural science and increases in labour efficiency, leaving most of the population with only one option to improve the circumstances of their family - emigration.

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[10]In his study of the District of Viana, Coelho (1861:243) reports of only three factories, two in Caminha, and one in the City of Viana, with a total workforce of just over 20.

3.3 The Passports of the District of Viana

Legislation passed in 1835 provided that the particulars of passports issued by the Civil Administration of each district for travel outside Portugal at a price of 800 reis were to be recorded in Passport Books[11]. The District Administration of Viana do Minho issued its first passport under this legislation on 8 October, 1835. During the next 60 years, 24,704 passports were issued, of which 1,522 were to residents of the Town/City of Viana itself.

The first passports carried the name of the holder, his birthplace, marital status, and profession, his destination, the name of the person declaring himself responsible for the application (this item was dropped during the 1850s), and a number of descriptive particulars concerning age, height, face, hair, eyebrows, eyes, nose, mouth, colour, and any other distinguishing features. In addition, the date of issue was recorded, together with the length of time for which the passport was valid (usually 60 days), and the signature of the official issuing the passport. Space was also provided for the recording of the intended travel itinerary (port of embarkation, etc.), but this was rarely used. This basic structure soon evolved to include the passport holder's current place of residence, his father's name, space for the inclusion of information regarding persons accompanying him. Much later, in 1927, passport photographs began to be included.

3.3.1 Trends in the Number of Passports Issued

Variations in the numbers of passports issued each year between 1835 and 1915 are depicted in Figure 3.5 for the whole of Portugal, the District of Viana, and the Town/City of Viana alone (data in Appendix 3.C).

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[11] Decree of 15 January, 1835.

Figure 3.5 Passports Issued to Residents of the Town/City of Viana (1), The District of Viana (2), and Portugal (3)
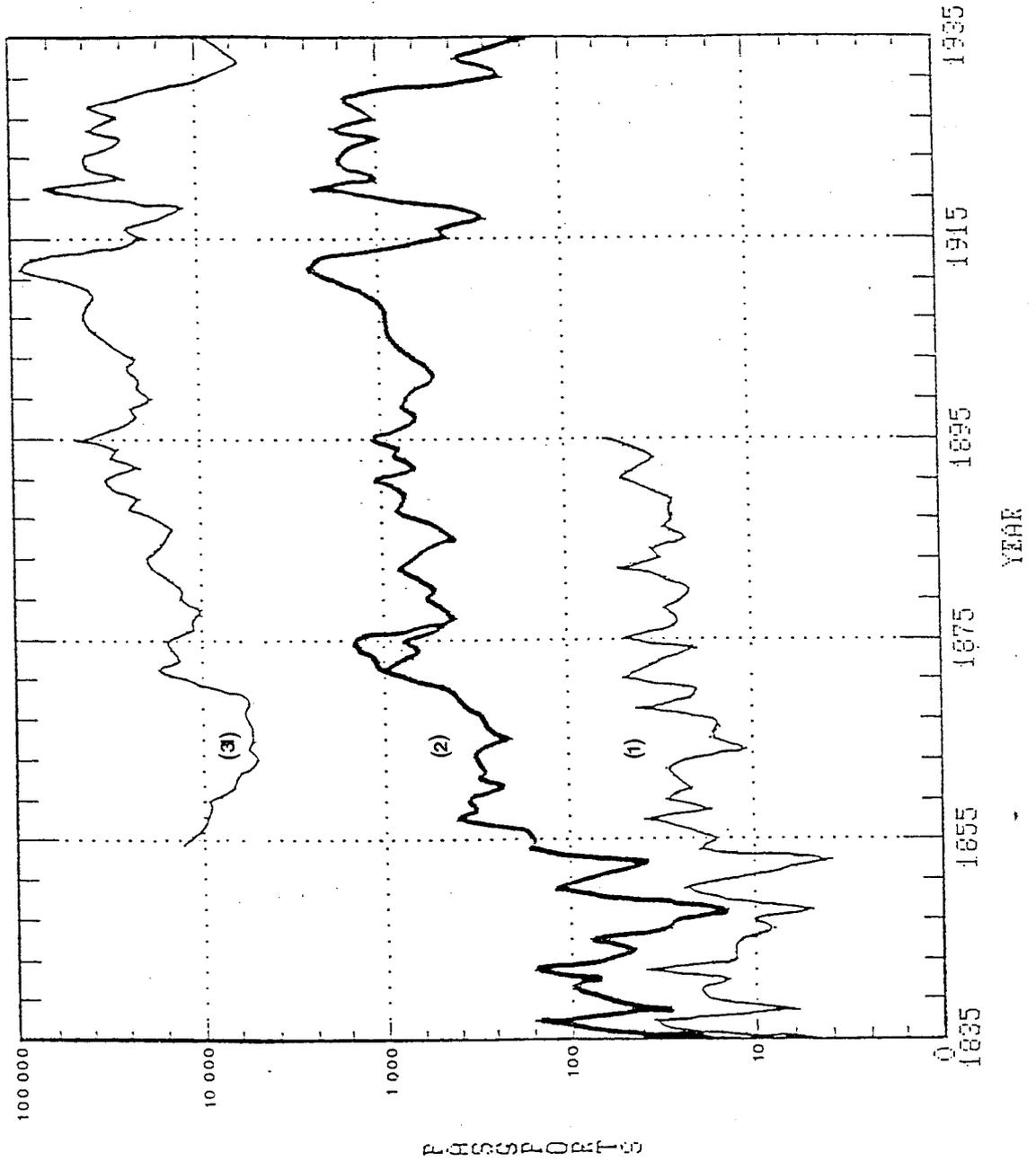
Several features of the Figure are particularly notable. First, between 1835 and 1855, before national statistics become available, the passports issued to residents of the Town/City of Viana account for a relatively large proportion of those issued for the whole District. Second, while the numbers of passports issued in the District of Viana do not decline as markedly as at the national level between 1855 and 1865, they do reflect national figures remarkably closely after the latter date. Third, the line representing the number of passports issued in the District of Viana can be seen to part for several years during the 1870s; the lower line here represents the passports issued to persons resident in Portugal, while the upper line also includes the large number of passports issued to Galicians at this time[12]. Finally, a steady increase in emigration can be seen following the end of the war between Brazil and Paraguay (1865-1870), accompanying the increased efforts of Brazil to attract immigrants, and the weakening of the Portuguese economy in the last thirty years of the nineteenth century.

3.3.2 The Passports Following the Censuses of 1864, 1878, and 1890

In order to study trends in emigration during the second half of the nineteenth century, data from the passports issued during the twelve months immediately following the Portuguese national censuses of 1864, 1878, and 1890, are examined[13]. Birthplace, place of current residence, sex, age, marital status, occupation, and destination information are available for each passport holder,

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[12] Whether or not this phenomenon was connected with the six years of political struggle that followed the Spanish Revolution of 1868 is uncertain. Failde (1902) writes of the alarming numbers of emigrants during the mid-1870s, and refers to the Law of 21 August, 1874 which was to ensure that only persons with the correct permissions could emigrate. A systematic random sample of one in five of the 623 emigrants from the Province of Pontevedra in 1874 showed that they were all male; 54% were aged between 15 and 24, the rest being fairly uniformly distributed over all other ages; 72% of them were single, the rest married; 66% were engaged in agriculture, 25% in trades & industry; and only 25% were travelling to Spanish Latin-America, the other 75% having given Brazil as their destination. It will be seen later that these characteristics differ significantly from those of Portuguese emigrants during the same period particularly with respect to age and, less surprisingly, destination.

[13] The censuses were enumerated on 1 January, 1864; 1 January, 1878; and 1 December, 1890; respectively.

together with any information concerning other persons travelling on the same passport (including their relationship to the holder). The number of passports issued in each of the three periods are shown in Table 3.3.

Table 3.3 Passports Issued in Viana in the Years Following the Censuses of 1864, 1878, and 1890

Census Year	Passports (1)	Persons (2)	(2)/(1)
1864	298	323	1.08
1878	440	493	1.12
1890	1064	1237	1.16

Although the three periods are chosen primarily to follow national censuses, in order that emigrant characteristics can be directly related to those of the enumerated population, they also fall, quite fortunately, in different phases of the escalation of emigration:

1864 marks the end of a period during which the number of passports issued each year was actually decreasing. It also lies in the middle of the period 1860-1868 which was that of the least emigration from Portugal during the second half of the nineteenth century. At the time, the weakness of the Brazilian economy (Bradford Burns, 1970), and fear of the impending war between Brazil and Paraguay, can only have served to deter prospective emigrants.

1878 lies between the first two large waves of emigration, following the political and financial crises of 1876 in Portugal, and during a period in which many complaints were voiced about the conditions experienced by immigrants in Brazil. 1878 was also the last year of the nineteenth century in which the number of legal emigrants was under 10,000.

1891, falling in the period of severe agricultural and commercial crisis in Portugal, and of fully subsidised Brazilian immigration[14], marks the second highest peak of legal Portuguese emigrants of the nineteenth century. Only the peak of 1895, the year

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[14] By this time many seductive articles, advertising free passages to Brazil on the steam ships which were departing twice a month, were appearing in the **A Aurora do Lima** (e.g. 28 November, 1890).

in which some of the strict military conscription legislation of 1887 was repealed[15], witnessed more emigration.

In connection with these three periods, an examination of the coverage given to emigration in the City of Viana's two-page newspaper - **A Aurora do Lima** (introduced in the 1850s) - provides some indication of the topic's popularity. By the late 1870s, a significant proportion of the newspaper was being devoted to Brazilian affairs, especially with respect to emigration. This is in sharp contrast with 1864, when there was a virtual absence of such articles. There were typically between two and four advertisements for ships (usually British) leaving Portugal for Brazil (a typical advertisment is shown in Appendix 3.D), together with articles of interest, such as the January, 1883 series in the **Conhecimentos Uteis** (useful information) Section, discussing the advantages offered by the Province of São Paulo.

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[15]Law of 12 September, 1887 (Legislação Portuguesa, 1887).

3.4 Methodology

The proposed analysis essentially consists of the comparison of estimated emigration rates between specific subgroups of the population. The exposed to risk of emigration in each subgroup is defined as the number of persons present at the census enumeration date. In the absence of information on clandestine emigration, emigration is defined as having occurred when a passport issued in the District of Viana during the same period contains the particulars of a resident of the District who was a member of the subgroup concerned. The event of interest and exposed to risk so defined will provide an initial rate of emigration.

Variations in these rates by age, sex, and marital status are considered, together with the differences by occupation (for which information is available on the 1890 census alone). Further, by postulating that certain subsets of the rates are related by constant proportions, the analysis allows the extent of any interaction between different factors to be assessed, and, by reducing the number of estimated parameters, is far more readily interpreted[16].

While sex and marital status are retained as factors having two and three levels respectively, constraints imposed by the data prompted ages to be grouped into just eight intervals using the following criteria.

First, the passports issued would not yield adequately large subgroups if divided into one year age intervals. Second, the three censuses of 1864, 1878, and 1890 are each grouped into (different) age intervals. Furthermore, the census age data suffer considerable heaping and, although these problems can be resolved using smoothing and regrouping techniques (Reis, 1987), for the purposes of this analysis division into ten-year groups at most ages suffices. Consequently, the 1864, and 1878 data are grouped into the eight intervals: 0-10, 11-15, 16-20, 21-25, 26-35, 36-45, 46-55, ≥56, while the 1890 data are grouped into the eight intervals: 0-9, 10-14, 15-19, 20-24, 25-34, 35-44, 45-54, ≥55. The five-year intervals in

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[16]The alternative would be to proceed as Mondschean (1986), estimating the probability of emigration and its variance separately for each cell using Bayes' formula, calculating the associated confidence intervals for these probabilities of emigration, and then interpreting the the resultant mass of figures.

the second decade of life were retained in order that the extent to which young males were sent abroad to avoid military conscription might be investigated, and compared with the effects of the legislation concerning conscription.

Variations by occupation can only be analysed by age, since the 1890 census only includes a cross-classification of occupation (divided into 12 groups[17]) by age (divided into four groups: 0-19, 20-39, 40-59, and ≥60) for those persons actively engaged in a particular occupational group[18]. For this analysis the four age groups were retained as tabulated, though it is clear that some error will be introduced in this way because the age groups begin at ages terminating with the digit 0 and will therefore not overcome the problems of digital preferences; for example, someone aged 19 may have given his age as 20 to the enumerator, thereby being incorrectly allocated to the 20-39 year age group. It can only be hoped that these errors will to some extent be compensated by digital preferences on the passports themselves, though the passport age distributions indicate that age heaping was far less extensive than on the censuses. The absence of emigration from certain occupational sub-groups, however, prompted the data to be regrouped into the following six categories: Agriculture, Trades & Industry, Transport, Commerce, **Proprietários**, and "Other".

Finally, it must be noted that variations in the rates of emigration between the levels of other, unobserved variables cannot be examined. For example, the anthropological literature suggests that household structure may have to some extent affected out-migration, such that perhaps those younger sons who were not to

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[17]The 12 occupational groups used for the 1890 census were: Agriculture, Hunting and Fishing, Mining, Trades & Industry, Transport, Commerce, Armed Forces, Public Administration, Professions, **Proprietários**, Domestic Service, and Unproductive/Unknown. The category **Proprietário** is somewhat problematic; it was introduced during the second quarter of the nineteenth century, and literally meant someone whose livelihood was derived from the rent collected on property which he owned. However, the status it implicitly carried ensured its growth in popularity beyond its original meaning. Thus, although the 1890 census enumerators were trained to ask probing questions in order to classify members of the population correctly (Recenseamento da População, 1890:XX-XXI), those drawing up other documents were less careful, generating pseudo **Proprietários** on these other documents. Other manuscript sources from Viana suggest that some of these pseudo **Proprietários** were engaged in agriculture.

[18]Members of the family without a lucrative occupation were only divided into two age groups: 0-13 and ≥14, and no information on domestic servants' ages was available at all.

inherit any property may have been encouraged to emigrate (see Section 2.2).

3.4.1 Approximation of the Exposed to Risk

The classification of each census by sex, age, and marital status, was of the **de facto** population and will therefore accurately reflect those resident in the District of Viana at the enumeration date.

The population exposed to risk during the three periods will have varied subject to the following incremental and decremental factors: birth, in-migration, out-migration, and death. Theoretically, fractional adjustments should therefore be made, not only for those who moved into or out of the population, but also for the individuals whose population subgroup changed during the period[19]. The data set in question, however, neither warrants, nor allows the aforementioned procedures to be applied effectively; the analysis will therefore proceed under the assumption that corrections for these effects would have a negligible net influence on the results.

A further problem arises in that for each sex and marital status, there is an unknown age category. However, the numbers in these unknown age categories are small, and since there is neither evidence that these persons might be concentrated at the older ages, nor that they might be proportionately distributed over all the age intervals, they were omitted from the exposed to risk. For the data on occupation however, the unknown category was already combined with the unproductive category and was therefore retained; particularly since the combined group was still relatively small.

Finally, the four boys aged 11-15 in 1878 who were recorded as married were also omitted from the exposed to risk. Although this was done for the practical reason that the lowest ages of married males to whom passports were issued were 25, 21, and 18 (in 1864, 1878, and 1890 respectively), it is also consistent with the knowledge that in a society exhibiting late marriage, such as that

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[19]See Benjamin & Pollard (1980) for a full treatment of this subject.

under consideration, it is highly unlikely that males would be married at these young ages.

3.4.2 The Allocation of Occurred Events to Subgroups

During the three periods, a number of passports were issued to persons who were not resident in the District of Viana at the time. In 1864 four passports were issued to Brazilians returning to Brazil, and one to a Galician also bound for Brazil. In 1878 two passports were issued to residents of the neighbouring Borough of Espozende, part of the adjacent District of Braga, and one to a person whose residence details were omitted. In 1890 two passports lacked residence information, and 75 were issued to residents of other districts of Portugal, 71 of whom were resident in Espozende. These passports were simply omitted from the analysis.

A more serious problem arose, however, when vital information was missing from passports issued to the population of interest. Primarily, this occurred when few details were recorded for persons accompanying the passport-holder, especially females. Since relatively few females were emigrating anyway, it was found appropriate to omit females from the main analysis, and to study those data separately. For males, age was only missing for two males, one single and one married, who emigrated in 1890; again, these data were omitted. Finally, information on marital status was missing from the passports of 148, 65, and 97 males during the three periods respectively. Since the mean age at marriage in this region of Portugal was around 30 years and the proportions of males with no recorded marital status who were under 26 years of age were 89, 97, and 96% respectively, the analysis will proceed under the assumption that they were all single. It will be seen later that this assumption may not be justified for the passports issued in 1864 on which information was recorded less explicitly (suggested here by the lower percentage of males with no marital status information who were under the age of 26).

Occupational information was recorded on all but three of the passports issued in 1890, but was notably missing from the details of persons accompanying the passport holder. This problem was overcome by only including the holders of passports in this analysis, which

can be justified since the exposed to risk derived from the census data was restricted to those actively engaged in a particular occupational group. The data are presented in Tables 3.4 and 3.5.

Table 3.4 Exposed to Risk (ETR) and Passports Issued (P) by Age and Marital Status, 1864-1890

Marital Status	Age Group	1864		1878		Age Group	1890		Raw Emigration Rates		
		ETR	P	ETR	P		ETR	P	(2)/(1)	(4)/(3)	(6)/(5)
		(1)	(2)	(3)	(4)		(5)	(6)			
Single	0-10	22539	9	21924	12	0- 9	22085	49	0.0004	0.0005	0.0022
Single	11-15	8828	114	8847	45	10-14	10207	88	0.0129	0.0051	0.0086
Single	16-20	7171	29	6816	38	15-19	7851	11	0.0040	0.0056	0.0014
Married		25	0	49	0		33	1	0.0000	0.0000	0.0303
Widowed		1	0	0	0		1	0	0.0000	0.0000	0.0000
Single	21-25	5217	49	5396	93	20-24	5401	171	0.0090	0.0172	0.0317
Married		1009	1	805	7		748	20	0.0010	0.0087	0.0267
Widowed		11	0	8	2		17	0	0.0000	0.2500	0.0000
Single	26-35	4702	47	5204	71	25-34	4579	179	0.0100	0.0136	0.0391
Married		5982	18	5336	48		5737	134	0.0030	0.0090	0.0234
Widowed		112	0	112	3		100	5	0.0000	0.0268	0.0500
Single	36-45	2216	10	2459	23	35-44	1982	81	0.0045	0.0094	0.0409
Married		7629	23	8481	54		7506	128	0.0030	0.0064	0.0171
Widowed		289	0	329	6		281	7	0.0000	0.0182	0.0249
Single	46-55	1470	4	1779	8	45-54	1430	21	0.0027	0.0045	0.0147
Married		7277	5	6841	16		7094	83	0.0007	0.0023	0.0117
Widowed		614	0	679	6		509	3	0.0000	0.0088	0.0059
Single	≥ 56	1822	1	1744	0	≥ 55	2040	4	0.0005	0.0000	0.0020
Married		8793	1	7424	9		9630	20	0.0001	0.0012	0.0021
Widowed		3408	1	3165	8		3387	7	0.0003	0.0025	0.0020
Total		89115	311	87398	449		90618	1012	0.0035	0.0051	0.0112

Table 3.5 Exposed to Risk and Passports Issued by Age and Occupation, 1890

Occupation Group	Age Group	Exposed to Risk (1)	Passports Issued (2)	(2)/(1)
Agriculture	0-19	10916	22	0.0020
	20-39	13184	407	0.0309
	40-59	13191	162	0.0123
	≥60	9176	11	0.0011
Industry	0-19	1799	2	0.0011
	20-39	3598	109	0.0303
	40-59	1960	31	0.0158
	≥60	753	1	0.0013
Transport	0-19	126	0	0.0000
	20-39	448	32	0.0714
	40-59	403	9	0.0223
	≥60	128	0	0.0000
Commerce	0-19	359	32	0.0891
	20-39	619	44	0.0711
	40-59	472	14	0.0297
	≥60	189	2	0.0106
Proprietário	0-19	1	0	0.0000
	20-39	46	10	0.2174
	40-59	140	6	0.0429
	≥60	153	2	0.0131
"Other"	0-19	1374	5	0.0036
	20-39	2119	12	0.0057
	40-59	1080	1	0.0009
	≥60	881	0	0.0000

3.4.3 The Model Used for the Analysis

The procedure adopted assumes that the emigration of individuals from a particular subgroup of the population at risk can be modelled as the outcome of a Poisson process[20]; thus, males in age group i ($i=1,2,\ldots,I$) with marital status j ($j=1,2,\ldots,J$) are subject to a constant rate of emigration (per person year of exposure to risk), μ_{ij}, say. It follows that if there are N_{ij} males in a particular subgroup, the probability that X_{ij} will emigrate in a particular year is given (with the ij suppressed) by:

$$P(X=x) = e^{N\mu} (N\mu)^x / x! \qquad x=0,1,2,\ldots,\infty \qquad (3.4.1)$$

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[20] The Poisson process is based on three postulates: that for an interval of small length the probability of an event occurring is proportional to the length of the interval, while the probability of two or more events occurring is essentially zero; and that the numbers of events occurring in nonoverlapping intervals are independent (see Hogg & Craig (1978), for example).

If N=1 the model simplifies to the number of times that a particular individual emigrates in the following year. Thus, the model implicitly assumes that individuals could emigrate more than once in a single twelve month period[21].

The likelihood of a particular set of data occurring for a given set of μ_{ij} is then computed as the product of these probabilities over all the ij, and the μ_{ij} are estimated by maximising this likelihood.

If no relationships between the rates of emigration from different subgroups are assumed to exist, then the maximum likelihood estimates (shown in the last columns of Tables 3.4 and 3.5) are simply given by:

$$\hat{\mu}_{ij} = x_{ij} / N_{ij} \qquad (3.4.2)$$

But, by postulating that certain subsets of the rates are related by constant proportions, revised estimates of the μ_{ij} can be computed. In particular, if the μ_{ij} are represented as the product of the exponents of factors representing the main effects of the variables and any interactions relative to these main effects, then:

$$\mu_{ij} = \exp \alpha_i \ \exp \beta_j \ \exp \gamma_{ij} \qquad (3.4.3)$$

Or, taking the natural logarithm of both sides:

$$\log_e \mu_{ij} = \alpha_i + \beta_j + \gamma_{ij} \qquad (3.4.4)$$

At the same time, the expected value of the dependent Poisson variable - the number of emigrants in a particular subgroup - can be written in the form:

$$\hat{x}_{ij} = E[X_{ij}] = \mu_{ij} \ N_{ij} \qquad (3.4.5)$$

Or, again taking natural logarithms:

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[21]This is not unreasona/ble, because it was quite feasable for migrants to travel more than once a year; the journey to Brazil took about 65 days by sailing ship or 40 days by steamship. Indeed, a handful of individuals were issued with more than one passport during a twelve month period; however, it is impossible to tell whether these people actually made more than one journey.

$$\log_e \hat{x}_{ij} = \log_e \mu_{ij} + \log_e N_{ij} \qquad (3.4.6)$$

Then, combining (3.4.4) and (3.4.6), a regression model of the generalised linear form (see McCullagh & Nelder, 1983) is derived:

$$\log_e \hat{x}_{ij} = \log_e N_{ij} + \alpha_i + \beta_j + \gamma_{ij} \qquad (3.4.7)$$

This equation is estimated by fitting:

$$\log_e x_{ij} = \log_e N_{ij} + \alpha_i + \beta_j + \gamma_{ij} + \varepsilon_{ij} \qquad (3.4.8)$$

where ε_{ij} is the Poisson error term representing random variation which accounts for the difference between the observed and expected number of emigrants.

If all the α, β, and γ parameters in (3.4.6) are included in the model, $\hat{x}_{ij}$ will equal x_{ij}, and the estimated emigration rates, $\hat{\mu}_{ij}$, will be identical to those yielded by (3.4.2). This is called the full, or saturated model. At the other extreme, if only one parameter, α_1, is estimated[22], then the model postulates that one constant emigration rate was common to all subgroups. Between these two extremes, the first parameter, α_1, yields the estimated emigration rate in one subgroup, the reference group, while the other parameters in appropriate combinations provide estimates of the emigration rates of other subgroups relative to this reference group.

By examining the relative fits of these reduced models, in which some of the parameters are equal to others, or are zero, the extent to which the postulated relationships explain variations in the data can be assessed using likelihood ratio tests[23]. A detailed description of this type of analysis can be found in Fienberg (1977).

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[22] In this case, $\alpha_i = 0$, $i = 2, \ldots, I$; $\beta_j = 0$, $j = 1, 2, \ldots, J$; and $\gamma_{ij} = 0$, $i = 1, 2, \ldots, I$, $j = 1, 2, \ldots, J$.

[23] For Poisson error structures, the scaled deviance of a log-linear model, defined as $S(c,f) = -2\log_e(l_c/l_f)$, is equivalent to the likelihood ratio test statistic and has an approximate chi-square distribution with $d_c - d_f$ degrees of freedom when the reduced model is correct; where l_c, l_f, and d_f are the likelihoods and degrees of freedom of the reduced and full models respectively (Nelder & Wedderburn, 1972).

3.5 The Models Fitted

Four main groups of models were fitted: one for each of the three sets of age/marital status data, and one for the age/occupation data available for 1890. However, no global model, using census year as a factor, was fitted to the age/marital status data for two reasons. First, the age groupings differ between the censuses, and second, the difficulty of fitting such a model in the presence of the different demographic structures of emigration that will be identified is not justified by any resultant ease of interpretation.

The models were fitted using the GLIM program (Baker & Nelder, 1978), and a p-value of 5% ~~was used~~ in the likelihood ratio tests for the comparison of pairs of alternative models[24].

The results are presented for each model individually in the following four subsections, and are summarised as the expected number of emigrants per thousand exposed to risk for the various factors in Table 3.12. The models best fitting the data are illustrated in the presentation of Table 3.12, since, for example, there are no significant differences in 1864 between the emigration rates of married and widowed males in the age groups spanning 21-45.

In order to illustrate the fitting procedure, the identification of a best model for the 1864 age/marital status data will be described in detail. For the other three groups sets of data only the final models and their interpretation will be discussed.

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[24] A p-value is the probability that an observed set of data will arise from a process specified by a certain model. Thus, when comparing the fit of two log-linear models, the p-value of the difference in scaled deviances of the two models is calculated: a high p-value indicates that there is no significant difference between the fits of the alternative models, and therefore that the adoption of the simpler model is justified.

3.5.1 The 1864 Age/Marital Status Model

The fact that only one of the emigrants in 1864 was recorded as widowed again raised the suspicions suggested earlier concerning the reliability of the marital status data in this year. The simplest approach to this problem was adopted; the married and widowed data were combined in order that any incorrect allocation of events to subgroups would affect the results in the same way. The net effect will be to slightly over-estimate the single emigration rates, while under-estimating the married and widowed rates.

In the notation of Section 3.4, the eight age divisions (21-25, 0-10, 11-15, 16-20, 26-35, 36-45, 46-55, $\geq$56) are represented by the α_i, $i=1,2,\ldots,8$, and the two marital statuses (single, married/widowed) by the β_j, $j=1,2$, so that the reference group (RG) is that of single males in the age group 21-25. Four models, for which the scaled deviances and degrees of freedom are shown in Table 3.6, were compared. These included the following parameters:

Model 1 : α_1

Model 2 : α_i, $i=1,2,\ldots,6$

Model 3 : α_i, $i=1,2,\ldots,6$; β_j, $j=1,2$

Model 4 : α_i, $i=1,2,\ldots,6$; β_j, $j=1,2$; $\alpha_2=\alpha_3=\alpha_4$

Table 3.6 The Models Fitted to the 1864 Age/Marital Status Data

Model	Absolute Scaled Deviance	Degrees of Freedom	Difference to previous model Scaled Deviance	Degrees of Freedom	p-value
1	189.16	11	-	-	-
2	40.57	6	148.59	5	$\approx$0.0000
3	6.07	5	34.50	1	$\approx$0.0000
4	8.81	7	2.74	2	0.2542

The figures show that the very poor fit to the data achieved by Model 1 is greatly improved by the inclusion of differences in the rates of emigration by age group in Model 2. Similarly, Model 3, the main-effects model incorporating differences by age and marital status, provides a further highly significant reduction in the scaled deviance. Finally, Model 4, which postulates that differences in the rates of emigration between the 21-25, 26-35, and 46-55 year age

groups are not significant, is accepted in preference to Model 3 because in this case the increase in deviance is not significant.

Thus, the model best fitting the 1864 data is Model 4, a main-effects model including seven parameters. The parameter estimates are shown in Table 3.7. The corresponding estimated emigration rates in Table 3.12 can be compared with an overall rate of 3.5‰ (311/89115).

Table 3.7 Parameter Estimates of the 1864 Model

Parameter	Estimate	Standard Error	Relative Risk
Age 21-45, Single	-4.731	0.0956	(RG)
0-10	-3.095	0.3468	0.05
11-15	0.381	0.1338	1.46
16-20	-0.781	0.2088	0.46
46-55	-1.343	0.3487	0.26
≥56	-3.211	0.7121	0.04
Married or Widowed	-1.173	0.1761	0.31

Deviance: 8.8, 7 Degrees of Freedom

First, it can be seen that military conscription caused a bimodal age distribution of emigration. However, it is remarkable that this distribution is particularly flat about the adult ages, evidenced by the fact that males in the 21-25 year age group were not significantly more likely to emigrate than those aged 26-35, or even those aged 36-45. Further, the rates therefore only decline rapidly with increasing ages somewhere between 36 and 45. Nevertheless, although this highest adult rate approaches 10‰, it is comfortably exceeded by the proportion of boys aged 11-15 who emigrate, 84% of whom reported their ages as 11, 12 or 13. To what extent these boys were specifically emigrating to avoid military conscription cannot be gauged from these data, but their number certainly explains the concerns of the authorities at the time, particularly if clandestine emigration would significantly add to this proportion.

Second, these results indicate that single males were more than three times as likely to emigrate than those who were married or widowed. It must however be borne in mind that this figure is estimated in the presence of the errors caused by poor recording of marital status.

3.5.2 The 1878 Age/Marital Status Model

Since no males were recorded as widowed and between the ages of 16 and 20 on the 1878 census, or on any of the passports issued in the ensuing twelve months, this empty subgroup was omitted, restricting the analysis to the remaining seventeen.

The model best fitting the 1878 data is a main-effects model including nine parameters. The parameter estimates are shown in Table 3.8. The corresponding estimated emigration rates in Table 3.13 can be compared with an overall rate of 5.1‰ (449/87398), which is 46% higher than in 1864.

Table 3.8 Parameter Estimates of the 1878 Model

Parameter	Estimate	Standard Error	Relative Risk
Age 21-35, Single	-4.183	0.0747	(RG)
0-10	-3.327	0.2982	0.04
11-15	-1.098	0.1668	0.33
16-20	-1.011	0.1785	0.36
36-45	-0.440	0.1385	0.64
46-55	-1.336	0.2049	0.26
≥56	-2.458	0.2802	0.09
Married	-0.469	0.1222	0.63
Widowed	0.741	0.2422	2.10

Deviance: 13.9, 10 Degrees of Freedom

Several changes in the age/marital status pattern of emigration between 1864 and 1878 are indicated, as emigration became more widespread throuhout Portugal.

There is a marked increase in the skewness of the age distribution of adult emigration, with the rate in the 21-35 year age group standing at almost twice its 1864 value, significantly exceeding the rate in the 36-45 year age group and dwarfing the rates at higher ages. At the lowest ages emigration rates have changed little, while there was actually a reduction in the rate of youths emigrating in the 11-15 year age group and thereby avoiding military conscription.

Of particular interest in the 1878 model are the highly significant differences between emigration rates of males with different marital statuses; while single males are now only 50% more

likely to emigrate than married males, the rates for widowed males
are more than twice as high again. The hypothesis that these high
rates for widowed males were only significant at younger ages was not
tenable, suggesting that males of all ages who lost their spouse were
relatively highly likely to emigrate. To what extent this phenomenon
may have been present in 1864 but obscured by the sometimes poor
recording of marital status on passports cannot be estimated, but it
will be seen that by 1890 (when information on passports was
exceptionally well recorded) there are again no significant
differences between the rates of emigration of married and widowed
males.

3.5.3 The 1890 Age/Marital Status Model

The model best fitting the 1890 data is essentially a
main-effects model, but with the addition of one extra interaction
parameter to accomodate the extremely low rate of emigration of
single males in the age group 15-19. The parameter estimates are
shown in Table 3.9. The corresponding estimated emigration rates in
Table 3.12 can be compared with an overall rate of 11.2‰
(1012/90618), which is 2.2 times the 1878 rate and 3.2 times the 1864
rate.

Table 3.9 Parameter Estimates of the 1890 Model

Parameter	Estimate	Standard Error	Relative Risk
Age 15-24, Single	-3.420	0.0724	(RG)
0- 9	-2.691	0.1602	0.07
10-14	-1.333	0.1289	0.26
25-34	0.194	0.0954	1.21
35-44	0.006	0.1104	1.01
45-54	-0.590	0.1318	0.55
≥55	-2.331	0.2014	0.10
Married or Widowed	-0.531	0.0785	0.59
Aged 15-19 and Single	**-3.150**	**0.3101**	**0.04**

Deviance: 15.8, 11 Degrees of Freedom

The changes occurring between 1878 and 1890 were even more pronounced than those between 1864 and 1878, reversing several of the trends identified previously.

The mode of the age distribution of emigration has shifted to the 25-34 year age group, where the rate is about 20% higher than in either of the adjacent age groups. At the same time, the distribution has become flatter again, with the rates of emigration at all but the highest adult ages lying between 30‰ and 40‰, and the rates in the 46-55 and ≥55 age groups having increased almost six-fold and three-fold respectively. These figures would suggest that it was not predominately younger families that were leaving for a new life in Brazil as may have been expected.

As mentioned in Section 3.5.2, by 1890 there are again no differences between the emigration rates of widowed and married males, and the rates for single males were generally only 75% higher by this time.

There was one emigration rate in 1890 that was very significantly different from that which would be estimated from a straightforward main-effects model; that for single males in the 15-19 year age group. The model was therefore fitted with an additional parameter for this subgroup. This parameter theoretically represents the difference between the true rate in this subgroup and the rate that would be estimated from a main-effects model. The parameter estimate shows that single males aged 15-19 were only 4% as likely to emigrate in 1890 as single males aged 20-24, whereas there are no significant differences between the emigration rates of married or widowed males in these two age groups.

On the one hand, this rate may be explained by a decrease in the ease of obtaining passports for this group - resulting from the new military conscription law of 1887. It is also conceivable that application of the new restrictions was tightened during 1890 and 1891 when nationalism was running high after the British had issued Portugal with the humiliating Ultimatum of 11 January, 1890, which required that the Portuguese immediately retire their force from several parts of Africa. On the other hand however, the rate may also reflect marriages of young males undertaken partly in order to ensure the issue of a passport. Finally, it is also possible that the figures around these ages are to some extent affected by the digital preferences outlined in Section 3.4, since the exact age 20

has moved from the 16-20 year age group of 1864 and 1878 to the 20-24 year age group of 1890.

The analysis of the 1890 passports can now be taken one stage further by investigating the differences in emigration rates between males employed in different occupational categories as collected for the census of that year.

3.5.4 The 1890 Age/Occupation Model

First, since the age/occupation model can only be applied to the 1890 data, the occupational distributions of the passports issued to males over the age of 14 for the three periods are presented in Table 3.10 (passports issued to younger males are excluded because they rarely gave an occupation).

Table 3.10 Occupations of Male Emigrants ≥15 Years Old, 1864-1890

Occupation Group	Year					
	1864	%	1878	%	1890	%
Agriculture	74	38	210	53	582	67
Industry	26	13	74	19	142	16
Transport	2	1	19	5	41	5
Commerce	27	14	43	11	64	8
Proprietário	4	2	19	5	18	2
"Other"	7	4	19	5	10	1
Unknown	55	28	9	2	9	1
Total	195	100	393	100	866	100

These figures demonstrate that although there was a shift over time towards the predominance of agricultural workers, they were by no means unrepresented among the earlier emigrants. Further, the data indicate that between 1864 and 1890, the increases in the number of emigrants engaged in agriculture are greater than of those in trades and industry, which, in turn, are higher than those in commerce.

The model best fitting the 1890 occupation data is essentially a main-effects model, but with the addition of one extra interaction parameter to accomodate the relatively high rate of emigration of males in the age group 0-19 who were engaged in commerce. The parameter estimates are shown in Table 3.11. The corresponding estimated emigration rates in Table 3.12 can be compared with an

overall rate of 14.5‰ (914/63115). This rate differs from the overall rate of the 1890 age/marital status model because both the events of interest and the exposed to risk have been redefined for this analysis (see Section 3.4.1).

Table 3.11 Parameter Estimates of the Age/Occupation model

Parameter	Estimate	Standard Error	Relative Risk
Age 20-39, Agriculture & Industry	-3.479	0.0430	(RG)
0-19	-2.649	0.1903	0.07
40-59	-0.919	0.0785	0.40
≥60	-3.112	0.2537	0.45
Transport & Commerce	0.823	0.1062	2.28
Proprietário	1.681	0.2398	5.37
"Other"	-1.526	0.2385	0.22
Aged 0-19 in Commerce	**2.888**	**0.2766**	**17.96**

Deviance: 24.8, 16 Degrees of Freedom

The age distribution of emigration broadly reflects that identified in the preceding analysis of the 1890 age/marital status data except that the differences in mean rates of emigration between the different age groups are accentuated. The overall rates of emigration in the 35-44 and 45-54 year age groups are 22.1‰ and 11.8‰ respectively in the age/marital status model, while in the current model the overall rates in the 20-39 and 40-59 year age groups are 30.7‰ and 12.9‰ . These figures would therefore suggest that the drop in the emigration rates at the higher ages occurs around the age of 40.

It is the occupational distribution, however, that is most revealing in this model. Despite the fact that the group engaged in agriculture accounts for 73.6% of the population at risk, and 65.9% of the passports issued, effectively determining the overall rate of emigration within each age group, this model identifies far greater variation than existed between different marital statuses.

First, as confirmed by the figures in Table 3.12, while a flood of agricultural workers from the hinterland applied for passports, and subsequently embarked for Brazil, propagating the idea of a rural

exodus, there were some occupational groups which were subject to far higher rates of emigration.

Second, however, there is no evidence of significant differences between the emigration rates of those engaged in trades & industry, a further 12.8% of the population at risk, and those in agriculture. This would confirm that the high levels of emigration seen in 1890 cannot be attributed to agricultural workers of the hinterland alone.

Third, it is hardly surprising that those engaged in the Transport occupational group were more than twice as likely to emigrate than those in agriculture or trades & industry, since the transport group includes seamen!

Fourth, there are no significant differences between the emigration rates of those engaged in commerce and those engaged in transport, except in the 0-19 year age group for which an additional parameter was required to accomodate the very high rate in the commercial group. Bearing in mind that the transport category includes seamen, commercial migration must certainly have been extensive for this to be so.

The additional parameter of the 0-19 year age group engaged in commerce theoretically represents the difference between the true rate in this subgroup and the rate that would be estimated from a main-effects model. The parameter improved the fit of the model enormously, and shows that those aged 0-19 and engaged in commerce were almost 18 times as likely to emigrate as those engaged in transport; this contrasts with the fact that there are no significant differences between the emigration rates of these two occupational categories at any other age. While this phenomenon is caused by the large number of young male **caixeiros**[25] who were sent to Brazil (31 of the 32 emigrants in this subgroup were **caixeiros**), the rate will to some extent be exaggerated if youths were recruited from other occupational groups to be sent to Brazil as **caixeiros**. It is interesting to note that the extra interaction parameter here served the opposite purpose from the one in the previous age/marital status model, which reduced the rate for young single males. This is

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[25]**Caixeiros** were apprentices, cashiers, etc., usually employed in Commerce. It is well known that during the nineteenth century many young males were sent to work in the merchant and trade houses owned by older emigrants already settled there.

because 28 of the 31 **caixeiros** in this subgroup were aged between 9 and 14.

Fifth, the **Proprietário** occupational group exhibits the highest estimated emigration rates of all. However, as described in Section 3.4, this category is somewhat problematic. The occupational description **Proprietário** was introduced during the second quarter of the nineteenth century, and literally meant someone whose livelihood was derived from the rent collected on property which he owned. However, the status it implicitly carried ensured its growth in popularity beyond its original meaning. Thus, although the 1890 census enumerators were trained to ask probing questions in order to classify members of the population correctly (Recenseamento da População, 1890:XX-XXI), those drawing up other documents were less careful, generating pseudo **Proprietários** on these other documents. Other manuscript sources from Viana suggest that some of these pseudo **Proprietários** were engaged in agriculture.

Finally, there is a virtual absence of emigration from the "Other" category (which comprises 8.6% of the population at risk). This category includes those engaged in hunting & fishing, mining, public administration, domestic service, those in the armed forces, those in the professions, and those with unproductive/unknown occupations. There is of course the possibility that some members of this group in the population may have given prospective rather than retrospective occupations when being issued with passports, such that for example a fisherman from the City of Viana itself may have described himself as being engaged in agriculture if he had already decided to find work on the coffee plantations of São Paulo upon arrival in Brazil; again, the extent of this practise, if it existed, cannot be gauged.

Table 3.12 Estimated Emigration Rates (per thousand) from Viana

Census Year — Age

1864

	0-10	11-15	16-20	21-25	26-35	36-45	46-55	≥56
Single	0.4	12.9	4.0	8.8			2.3	0.4
Married / Widowed			1.2	2.7			0.7	0.1

1878

	0-10	11-15	16-20	21-25	26-35	36-45	46-55	≥56
Single	0.5	5.1	5.6	15.2		9.8	4.0	1.3
Married			3.5	9.5		6.1	2.5	0.8
Widowed				31.9		20.6	8.4	2.7

1890

	0-9	10-14	15-19	20-24	25-34	35-44	45-54	≥55
Single	2.2	8.6	**1.4**	32.7	39.7	32.9	18.1	3.2
Married / Widowed			19.2		23.3	19.4	10.7	1.9

1890

	0-19	20-39	40-59	≥60
Agriculture	2.2	30.8	12.3	1.4
Industry				
Transport	5.0	70.1	28.0	3.1
Commerce	**89.1**			
Proprietário	11.7	165.5	66.1	7.4
"Other"	0.5	6.7	2.7	0.3

In conclusion, the exceedingly high rates of emigration in the transport and commerce categories, some approaching 10% of the population at risk per year, can only be attributed to substantial repeat migration, the extent of which can be gauged from Table 3.13 which shows the number of previous trips abroad for the 603 passports issued in the District of Viana during a 12 month period falling in 1896 and 1897.

Table 3.13 Number of Previous Trips Abroad, 1896 and 1897

Previous Trips	Passports	%	Σ%
Unknown	183	30	30
1	233	39	69
2	117	19	88
3	36	6	94
4	21	4	98
≥5	14	2	100
Total	603	100	

It is likely that some of these repeat migrants were engaged in commercial migration, but the extent of this can not be gauged. Again, the identification of different passports issued to the same individual, will enable the process of repeat migration to be studied in more detail. Further, return migration of those who made only one trip, of which the preceding analyses tell us nothing, can be investigated by identifying other records, such as entries on electoral registers, or cemetery records, pertaining to individuals who were previously issued with passports.

3.6 Kinship and Emigration

The small numbers involved in this Section do not permit rigorous statistical analysis, but they do throw enough light on the relationships that existed between emigrants to be of some use.

First, female passport holders are considered. In 1864, two married women, aged 25 and 30, were issued with passports, each took one son with them to Brazil. In 1878, 10 women, three of which were accompanied, were issued with passports. Of the three women travelling accompanied, one took a son, one took two daughters, and the third was travelling with her younger unmarried sister; all three were married. Of the other seven women; four were single, three married, and one widowed; and only four were less than 35 years old. In 1890, 70 (7%) of the passports issued were held by women. Of these, 31, 17 of which were married, took 30 sons, 14 daughters, 5 sisters, 2 nephews, and 1 servant to Brazil; the other 39 women travelled alone. The women who travelled alone were predominately single (31 of the 39), and their ages were distributed in roughly the same manner as those of the males who emigrated the same year.

Second, males and females accompanying male passport holders are considered. Table 3.14 shows the relationships between male passport holders and those accompanying them; the "Others" category includes brothers, nephews, sisters, neices, servants, grandchildren, and parents; in that order.

Table 3.14 Those Accompanying Male Passport Holders

Kinship	1864	1878	1890
Sons	7	17	80
Daughters	1	16	32
Wives	3	10	32
Others	12	10	22
Total	23	53	166

Finally, the number of persons accompanying each passport holder was also available for the repeat migration data presented in Section 3.5. Since 31 of the 54 persons accompanying passport holders were with ones on at least their second trip, there is some, albeit weak, evidence to suggest that emigrants were sometimes returning to Portugal to collect their immediate family and take them to Brazil.

3.7 Origins of the Emigrants

In order to examine whether males resident in different parts of the District of Viana were subject to different rates of emigration, the data used for the age/marital status models were regrouped by borough[26] and a further series of log-linear models was fitted using the following two factors: year (with 3 levels) and borough (with 10 levels). The regrouped data are presented in Table 3.15, together with the maximum likelihood estimates of the rates assuming that no relationships between them exist.

The model best fitting the place of residence data was the main-effects model including 12 parameters. The final deviance was 119 with 18 degrees of freedom; a poor fit to the data. The parameter estimates are shown in Table 3.16, while the corresponding estimated rates are set out in Table 3.15 with the other maximum likelihood estimates and on the map of the District in Figure 3.6; these rates can be compared with the overall rate (from Section 3.5.3) of 11.2‰ (914/63115).

It would of course have been possible to increase the goodness of fit by adding extra interaction parameters to the model, but this course of action was rejected because no substantive reasons could be found for the pattern of deviations from the model of independent year and borough effects. It is therefore likely that certain important (unobserved) explanatory variables have been omitted from the analysis. However, while the age/marital status structure of the District has been shown to explain much of the variation in emigration rates, close examination did not suggest that this structure differed significantly between boroughs. Although methods exist for analysing extra variation in Poisson models[27], their application lies beyond the purposes of this study.

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[26]The numbers of emigrants from individual boroughs were too small to allow further division by age, marital status, or occupation.

[27]See, for example, Brillinger (1986).

Figure 3.6 Male Emigration Rates (per ten thousand population) from the District of Viana, 1864, 1878, 1890

SPAIN

Minho

S P A I N

Pontevedra

Lima

BRAGA

Atlantic Ocean

Esposende

•4

17
23
136

•5

21
17
134

•9

23
41
64

37
25
64

•10

19
59
114

89   •6
101
197

•3

33
21
112

2
•

32
54
59

•7

25
67
104

•8

56
85
147

•1

The Concelhos of Viana

1. Viana do Castelo
2. Arcos de Valdevez
3. Caminha
4. Melgaço
5. Monção
6. Paredes de Coura
7. Ponte da Barca
8. Ponte de Lima
9. Valença
10. Vila Nova de Cerveira
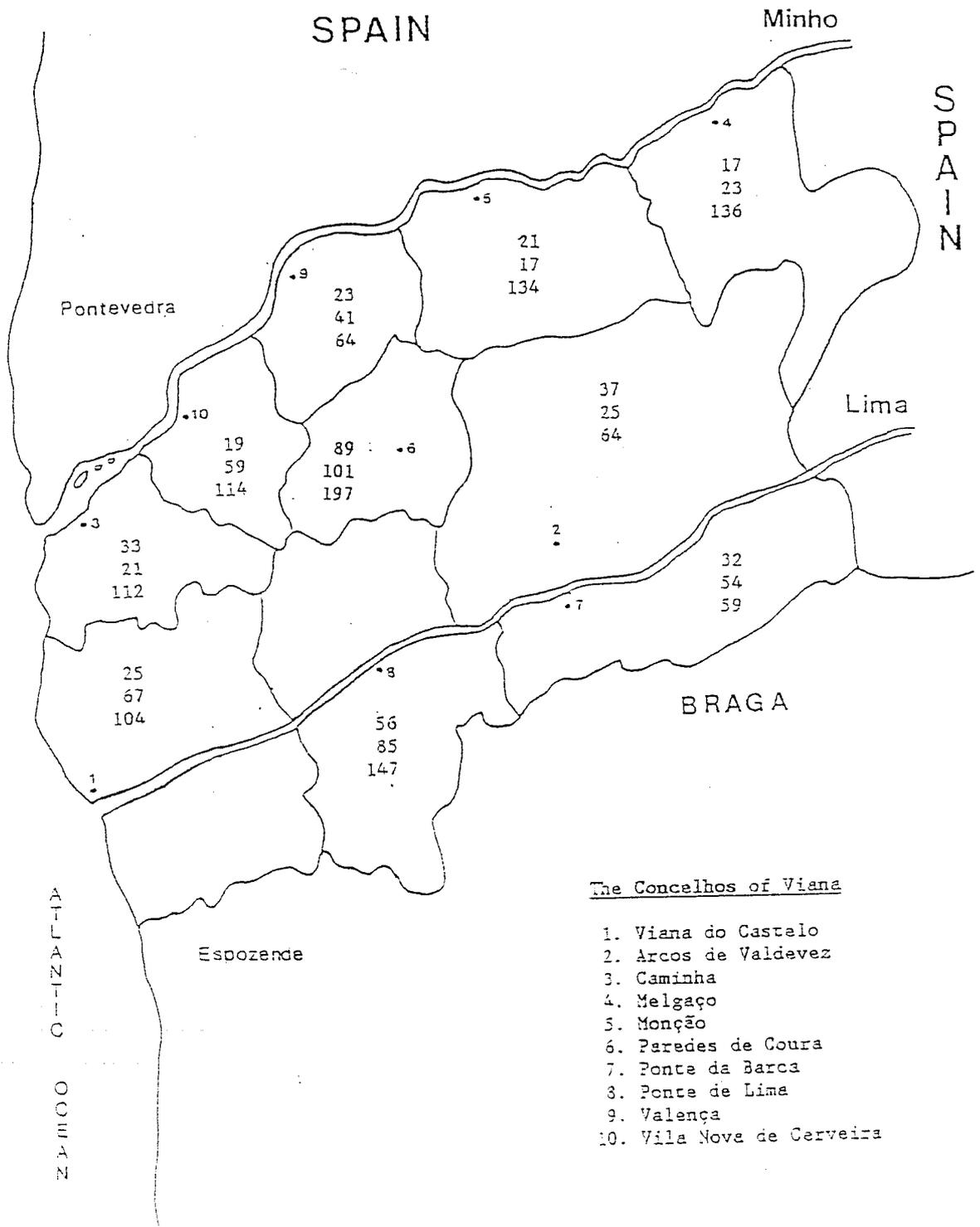
Table 3.15 Exposed to Risk and Passports Issued by Year and Borough

Borough of Residence	Census Year	Exposed to Risk (1)	Passports Issued (2)	(2)/(1)	Independence Model
Viana	1864	18549	47	0.0025	0.0035
	78	18028	121	0.0067	0.0051
	90	19640	205	0.0104	0.0111
Arcos de Valdevez	1864	12867	48	0.0037	0.0022
	78	12809	32	0.0025	0.0033
	90	13488	87	0.0064	0.0071
Caminha	1864	6014	20	0.0033	0.0030
	78	5179	11	0.0021	0.0043
	90	5450	61	0.0112	0.0095
Melgaço	1864	6520	11	0.0017	0.0031
	78	6082	14	0.0023	0.0045
	90	6267	85	0.0136	0.0099
Monção	1864	10011	21	0.0021	0.0031
	78	9822	17	0.0017	0.0045
	90	10515	141	0.0134	0.0099
Paredes de Coura	1864	5278	47	0.0089	0.0068
	78	5258	53	0.0101	0.0100
	90	5343	105	0.0197	0.0218
Ponte da Barca	1864	5336	17	0.0032	0.0026
	78	5397	29	0.0054	0.0038
	90	5242	31	0.0059	0.0082
Ponte de Lima	1864	13749	77	0.0056	0.0051
	78	14188	121	0.0085	0.0075
	90	14345	211	0.0147	0.0163
Valença	1864	6607	15	0.0023	0.0023
	78	6400	26	0.0041	0.0033
	90	6389	41	0.0064	0.0072
Vila Nova de Cerveira	1864	4184	8	0.0019	0.0034
	78	4239	25	0.0059	0.0050
	90	3939	45	0.0114	0.0108

Table 3.16 Parameter Estimates of the Residence Model

Parameter	Estimate	Standard Error	
1864, Viana	-5.665	0.0732	(RG)
Year:			
1878	0.381	0.0738	
1890	1.160	0.0648	
Borough:			
Arcos de Valdevez	-0.438	0.0931	
Caminha	-0.155	0.1164	
Melgaço	-0.110	0.1085	
Monção	-0.115	0.0909	
Paredes de Coura	0.678	0.0870	
Ponte da Barca	-0.299	0.1252	
Ponte de Lima	0.385	0.0716	
Valença	-0.430	0.1220	
Vila Nova de Cerveira	-0.201	0.1245	

Deviance: 119, 18 Degrees of Freedom

First, the independence model reproduces the overall rates of 3.5‰, 5.1‰ and 11.2‰ for 1864, 1878 and 1890, respectively. Second, the model does succeed in highlighting the main contrasts in emigration rates between boroughs. It demonstrates that the highest rates were not from the Borough of Viana itself, but from the poorly accessed upland Borough of Paredes de Coura (97% higher than the Viana rate), and the large neighbouring Borough of Ponte de Lima (47% higher than the Viana rate), while the lowest rates, experienced in several boroughs were up to 46% lower than those of Viana.

The poor fit of the model, is caused primarily by the enormous increase in the initially low rates of Caminha, Melgaço and Monção, between 1878 and 1890. Of these it is known that Melgaço and Monção were among the first to be affected by phylloxera after it manifested itself in Valença in 1884 (**A Aurora do Lima**, 5 December, 1887)[28]. The obvious explanation that these boroughs are perfect examples of the late nineteenth century rural exodus, however, also conceals a more subtle issue. It is likely that the independence postulate of the Poisson model (see Section 3.4) is to some extent violated in the analysis of these data, since it was not uncommon for several residents of a single parish to emigrate together (suggested by the fact that they were issued with consecutively numbered passports).

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[28] In fact, Melgaço and Monção were identified as areas of particular poverty in an article appearing in the national newspaper in 1882 (**O Primeiro de Janeiro**, 2 January, 1882).

3.8 Destinations of the Emigrants

There is relatively little that can be said about the countries of destinations of the emigrants since 98%, 97%, and 98% of them gave their destinations as Brazil in 1864, 1878, and 1890, respectively, except that these figures are even higher than those for the whole of Portugal reported in Section 2.4. While those who did not go to Brazil tended to be travelling within Europe in 1864 and 1878, in 1890, 1.5% of the emigrants were travelling to Africa.

However, the 1890 data allow the distribution of destinations within Brazil to be examined[29]. Table 3.17 shows this distribution for the 671 emigrants, regardless of sex and whether or not they were passport holders, who gave their province of destination within Brazil. The provinces of Brazil are shown in Figure 3.7.

Table 3.17 Brazilian Destinations of Emigrants, 1890

Province	Number	%	Σ%
1. Amazonas	12	1.1	1.1
2. Pará	27	2.4	3.5
6. Pernambuco	6	0.5	4.0
7. Bahia	4	0.3	4.3
14. Minas Gerais	2	0.2	4.5
15. São Paulo	43	3.8	8.3
17. Rio de Janeiro	575	50.6	58.9
20. Rio Grande do Sul	2	0.2	59.1
Total	671	59.1	

---

[29] The destinations of all emigrants between 1855 and 1865 are given by Freitas (1867), and show that during the period 1,671 of the 1,677 who left Viana gave their destination as, specifically, Rio de Janeiro, a higher proportion than from any other district (Serrão, 1974:42).

Caution is required because 41% of all emigrants only stated that they were bound for Brazil, but it is nevertheless clear that few emigrants were heading for the north of Brazil (provinces 1-7), and, perhaps more surprisingly, just as few declared that they were going to São Paulo, despite the fact that subsidised emigration was oriented around the coffee plantations of that province. The low incidence of São Paulo may be partly explained by a disparity between the destinations of legal and clandestine emigrants, and also the fact that free transport was provided by the Brazilian government from Rio de Janeiro to the place of eventual settlement[30]. The high proportion setting out for Rio de Janeiro is also to some extent due to the numbers of emigrants engaged in commerce.

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[30] The availability of this benefit was pointed out in a Brazilian advertisement appearing in the **A Aurora do Lima** (5 June, 1882), and was re-iterated several times thereafter.

Figure 3.7 The Provinces of Nineteenth Century Brazil

1. Amazonas
2. Pará

3. Maranhão
4. Piauí

5. Ceará
6. Pernambuco
7. Bahia
8. Rio Grande do Norte
9. Paraíba
10. Alagoas
11. Sergipe

12. Mato Grosso
13. Goiás

14. Minas Gerais
15. São Paulo
16. Espirito Santo
17. Rio de Janeiro

18. Paraná
19. Santa Catarina
20. Rio Grande do Sul
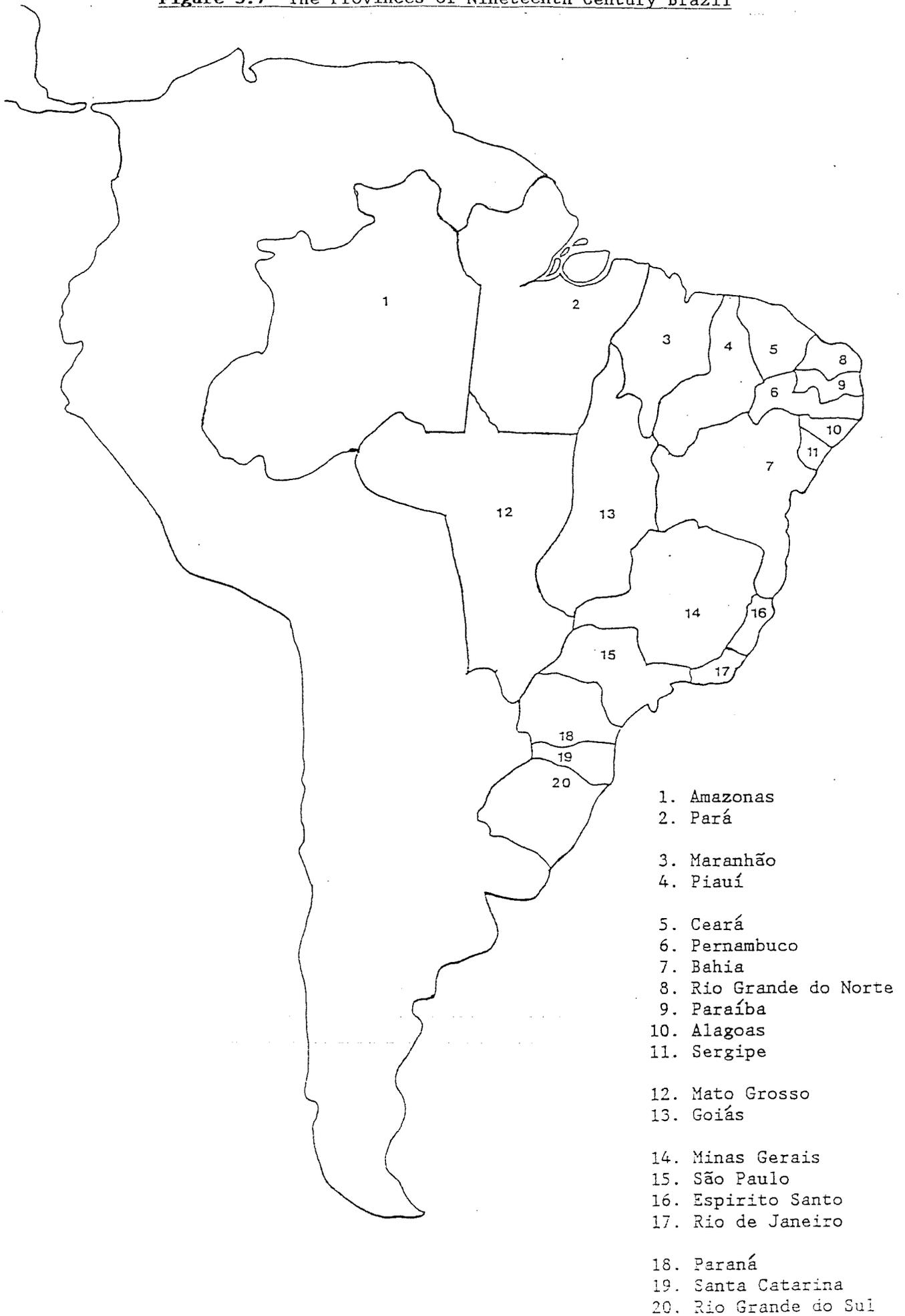
3.9 A Population-Model Estimate of Clandestine Emigration

As discussed in Section 2.7, clandestine emigration consisted of two streams: that of males aged between 14 and 21, who were unable to obtain passports because of military conscription legislation, and that consisting of people for whom the price of a passport and passage was prohibitively high[31]. In addition, Halpern Pereira (1981:22) refers to two different types of clandestine emigration: that without passport - embarking mainly from Lisboa, and that with false passports obtained from **engajadores** - embarking mainly from Vigo, Galicia. Essentially, the **engajadores** arranged transportation to Brazil, in return for which emigrants worked under obligation until they had repayed their incurred debt. Of course, by its very definition, clandestine emigration is difficult to measure; no reliable estimates of clandestine emigration from nineteenth century Portugal exist.

However, data available from the censuses combined with annually compiled data concerning population change allow a very simple model to be formulated which will provide such an estimate. Table 3.18 shows the **de facto** population of the District given by the four censuses of 1864, 1878, 1890, and 1900, including the birthplace information recorded on the latter two enumerations. Table 3.19 shows all the available statistics on population change in the District of Viana between 1864 and 1900.

Table 3.18 The **de facto** Population of the District of Viana

| Birthplace | Census Year | | | |
	1864	1878	1890	1900
Same borough			196,122	202,739
Same district			5,991	6,696
Other district			3,725	4,609
Other country			1,528	1,223
Total	204,679	212,550	207,366	215,267

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[31]Even after free passage to Brazil became available, numerous complaints began to be directed at the price of passports (4$500 reis in 1891) (**A Aurora do Lima**, 16 January, 1891).

Table 3.19 Population Change in the District of Viana[32]

Year	Births	Deaths	Emigrants
1864	(a) 5,298	(a) 3,974	(d) 297
1865	5,172	4,078	205
1866	5,557	4,065	271
1867	5,524	3,877	283
1868	-	-	328
1869	5,579	4,199	388
1870	5,193	4,059	450
1871	5,482	3,536	790
1872	5,538	4,213	1,040
1873	5,203	4,556	707
1874	6,052	4,388	659
1875	5,719	3,809	767
1876	5,555	4,485	469
1877	-	-	385
1878	5,480	4,031	440
1879	5,546	4,389	580
1880	5,584	4,464	521
1881	5,742	4,106	682
1882	5,649	3,767	835
1883	5,664	3,965	706
1884	5,685	3,909	612
1885	5,878	3,970	399
1886	6,111	3,678	484
1887	5,945	3,977	671
1888	6,058	3,536	842
1889	6,237	3,961	735
1890	5,681	4,000	1,036
1891	(b) 5,644	(b) 4,379	(b) 1,248
1892	5,478	3,508	817
1893	(c) 5,485	(c) 3,647	(c) 1,065
1894	4,756	3,386	997
1895	4,731	3,323	1,438
1896	5,024	4,025	1,087
1897	4,861	3,335	836
1898	4,476	2,958	1,041
1899	4,535	3,231	933
1900	4,972	3,391	950

Sources: (a) Estatisticas da População do Distrito de
Vianna do Castello, 1837-1890.

(b) Movimento da População, 1891-1893.

(c) Annuario Estatistico de Portugal, 1900.

(d) Number of Passports Issued to Portuguese;
Passport Books.

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[32] Halpern Pereira (1970) points out that there is a slight under-registration of births since non-Catholics, and sometimes infants dying soon after birth, were not baptised. Further, she warns against too much reliance on the official tables of population movement from which these data are drawn.

Most models of population change consider the whole population of a particular area over time, calculating estimates of net migration from the numbers enumerated at two successive censuses and the numbers of births and deaths occuring between them. The resulting estimate is rarely informative however, since it usually only provides the difference between out-migration and in-migration, and gives no information on the relationship between these two components. Here, the division of the **de facto** population by birthplace on the 1890 and 1900 censuses enables attention to be focused upon the native population of the District. This approach overcomes the aforementioned difficulty by limiting the effects of internal migration; "in-migrants" only remain of interest if they were born in the District - in which case they are in fact return migrants.

In order to investigate the extent of clandestine emigration, the components of population change (most of which can be estimated from the above data) are specified as follows:

P_1, P_2 : The **de facto** population at censuses 1 and 2.

B	: Births	occurring between the two censuses				
D	: Deaths	"	"	"	"	"
I	: In-migration	"	"	"	"	"
O	: Out-migration[33]	"	"	"	"	"
EL	: Legal Emigration	"	"	"	"	"
EC	: Clandestine Emigration	"	"	"	"	"
R	: Return Migration	"	"	"	"	"

These components are subdivided into those who were natives (superscript N) of the District of Viana, and those in-migrants (superscript I) who were born elsewhere, except that all the births (B) are natives of the District, and the in-migrants between the censuses (I) are defined to be entering the District for the first time.

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[33]Here, the term out-migration is used to describe only those who left for other districts of Portugal; i.e. out-migration excludes emigration.

Then:

$$P_2 = P_1 + B - D + I - O - EL - EC + R \qquad (3.7.1)$$

$$P_2^N = P_1^N + B - D^N \qquad - O^N - EL^N - EC^N + R^N \qquad (3.7.2)$$

$$P_2^I = P_1^I \qquad - D^I + I - O^I - EL^I - EC^I + R^I \qquad (3.7.3)$$

It can be seen that the equation of interest (3.7.2) is not affected by the unknown component, in-migration (I), which appears in (3.7.1) and hampers similarly constructed population models. The equations are clearly related since the columns can be summed such that (3.7.1) = (3.7.2) + (3.7.3).

3.9.1 Clandestine Emigration, 1890-1900

In order to be able to apply equations (3.7.2) and (3.7.3), the assumption that deaths and legal emigrants are distributed between natives and in-migrants in proportion to their respective mean populations is incorporated, such that:

$$D^N = \frac{P_1^N + P_2^N}{P_1 + P_2} \cdot D \qquad (3.7.4)$$

$$EL^N = \frac{P_1^N + P_2^N}{P_1 + P_2} \cdot EL \qquad (3.7.5)$$

This assumption can be justified for emigrants because, although in-migrants were probably slightly less prone to emigrate than natives[34], the proportion of natives at the two censuses is more than 97%, thus minimising any resultant error.

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[34] Between 1835 and 1895 only 7% of the emigrants from the Town/City of Viana itself were born outside the District, while the resident population of in-migrants exceeded 10% (see Chapter 6).

The estimates of B, D, and EL are derived from Table 3.19, adjusting for the fact that the censuses were both taken on the first of December by using equations of the form[35]:

$$X = (1/12) \cdot X_{1890} + \sum_{1891}^{1890} X_y - (1/12) \cdot X_{1900} \qquad (3.7.6)$$

This leads to the estimates: $B=50,021$; $D=35,234$; $D^N=34,310$; $EL=10,416$ and $EL^N=10,146$. These figures are then inserted in equations (3.7.1) to (3.7.3), leading to estimates of the residual terms:

$$EC + O - R - I = -3,533 \qquad \text{(from 3.7.1)}$$

$$EC^N + O^N - R^N = -1,757 \qquad \text{(from 3.7.2)}$$

$$EC^I + O^I - R^I - I = -1,776 \qquad \text{(from 3.7.3)}$$

It can be seen that the first figure is of little use because it might be argued that clandestine emigration, though substantial, was simply compensated by in-migration.

The second figure, however, suggests that between 1890 and 1900, return migration of natives of the District of Viana actually exceeded the sum of clandestine emigration and out-migration to other districts of Portugal. This contadicts the literature reviewed earlier which suggested that clandestine emigration was the largest of these three residual components.

The third figure accounts for in-migration to the District of Viana, and only serves to demonstrate that this component of population change cannot be responsible for the results from the second equation.

For the residual of interest, -1,757, to have been positive, there would have had to have been an under-enumeration in 1890, or an over-enumeration in 1900 of the order of 1%, both of which are

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[35] Equation (3.7.6) assumes that the overall effects of a non-uniform distribution of births, deaths, or emigration over the calendar year will be negligible.

relatively unlikely since by 1890 the censuses were regarded as more reliable and complete (Feijó, 1983:49). Alternatively, births would have had to be under-recorded or deaths over-recorded: the former would have had to have suffered under-recording of the order of 4%, which is unlikely given the importance of baptism in a Catholic country such as Portugal; the latter is hardly likely either.

Thus, although not leading to an absolute estimate of clandestine emigration, the analysis suggests that between 1890 and 1900 clandestine emigration was not substantial, perhaps even negligible.

3.9.2 Clandestine Emigration, 1864-1890

Having developed an understanding of the relationships between the components of population change outlined in Section 3.9.1, particularly the extent of in-migration, it is tempting to now use equation 3.7.1 for the inter-censal periods 1864-1878, and 1878-1890.

Since the censuses of 1864 and 1878 span a period of exactly 14 calendar years, for which the number of births and deaths are missing for two years (1868 and 1877), B and D were estimated using equations of the form:

$$ X = (14/12) \cdot \sum_{1864}^{1877} X_y \qquad \text{where } X_{1868}=X_{1877}=0 \qquad (3.7.7) $$

The censuses of 1878 and 1890 were 12 years and 11 months apart, leading to equations of the form:

$$ X = \sum_{1878}^{1890} X_y - (1/12) \cdot X_{1890} \qquad (3.7.8) $$

The numbers of legal emigrants were not directly available for either of the two periods, so the numbers of passports issued were used instead. This will clearly under-estimate legal emigration, and thereby over-estimate clandestine emigration, as it was shown in

Section 3.3 that the ratio of emigrants to passports increased from 1.08 to 1.16 between 1864 and 1890.

For 1864-1878: B=76,851; D=57,446 and EL=7,039. And, for 1878-1890: B=75,097; D=51,240 and EL=8,252. Then, estimates of the residual components are:

1864-1878:   EC + O - R - I = 6,233   (from 3.7.1)

1878-1890:   EC + O - R - I = 9,629   (from 3.7.1)

Although these figures may be attributed partly to under-enumeration of the 1864 and 1878 censuses (the 1878 census being an improvement on that of 1864), and to an unknown extent by out-migration to other districts of Portugal, the contrast with the figure of -3,533 for the period 1890-1900 nevertheless suggests that clandestine emigration was substantial during both periods, particularly between 1878 and 1890 when it might even have exceeded legal emigration. This would agree with the number of articles appearing in the **A Aurora do Lima** during the 1880s concerning the prosecution of **engajadores** and clandestine emigrants, and particularly the article of 31 October, 1888, which blames the "recent surge in clandestine emigration" on the new military conscription law of 12 September, 1887. This last law was superceded by the law of 1895, which was aimed at relieving the flow of clandestine emigrants.

3.10 Summary

In the absence of extensive official statistics on Portuguese emigration in the second half of the nineteenth century, a careful and detailed analysis of the original passports has enabled hitherto anecdotal evidence to be quantified. Unfortunately however, since the population of the District of Viana survived largely from subsistence farming, it is not possible to set the high levels of emigration identified in the context of models of migration which are dependent on comparisons of wage levels, etc., and the analysis has therefore relied on the interpretation of the characteristics of emigrants and their comparison with those of the population from which they were drawn.

The data demonstrate that although the emigration phenomenon did indeed broadly change from one of single males aged 21-35 to one of mass emigration - the notorious rural exodus - this description oversimplifies the process. The age distribution of emigrants, initially quite flat and highest in the age interval 21-25, became concentrated and skewed about the age group 21-25. Then, it broadened again around a modal age group 25-34.

Similarly, the distribution of emigration between marital statuses exhibited an increase in variation followed by a decrease. While single males were initially three times as likely to emigrate as married or widowed males, widowed males became the most likely to emigrate. Then differences between married and widowed males disappeared again, and single males were only 50% more likely to emigrate than those who were or had been married.

Throughout the period, the wealthier sectors of society - landowners and those engaged in commerce - were far more likely to emigrate, or were more likely to emigrate more often.

With respect to the geographical distribution of emigration rates, the poor fit of the statistical model estimated is attributed to the different increases in emigration rates from different boroughs of the District.

Unfortunately, the simultaneous examination of all the variables considered (age, marital status, occupation, and place of residence) is not possible. Neither is it possible to assess the importance of unobservable variables, such as household structure.

The phenomenon of clandestine emigration is also shown to have changed in two directions during the period, with an increase to extremely high levels suggested between the periods 1864-1878 and 1878-1890, and then a decrease to its virtual absence in the period 1890-1900.

Finally, the data do not allow a comparison of hypotheses of rural flight versus stage migration, since the only urban centre of more than a couple of thousand inhabitants was the City of Viana itself. In 1890 there were only 1,258 residents of the City who had been born in a different borough of the District; of these, six emigrated; however, this does not provide a sufficient sample from which to draw statistically significant conclusions.

CHAPTER 4

THE RECONSTITUTION OF THE CITY OF VIANA DO CASTELO

4.1 Introduction

The paucity of aggregate demographic statistics for nineteenth century Portugal results in the need to exploit fully various sources of supplementary data. An increasingly popular approach involves the reconstitution of one town or city using a database of several manuscript sources. This enables micro-analyses to be performed which enhance the understanding of secular demographic trends derived from those aggregate statistics that are available[1]. However, these studies raise major caveats in their representativeness (Schofield, 1972; Levine 1976; Åkerman, 1977). Also, they provide a picture of just one locality, and no regional patterns can therefore be identified; they are held to be non-comparable and non-cumulative, so that any amount of such micro-studies would not enable the reconstruction of the macro-structure of a whole society (Macfarlane, 1977). Nevertheless, within these constraints, they can be extremely informative about a particular society.

In the context of migration, although very few historical societies explicitly recorded population movements[2], reconstitution studies allow techniques to be applied which provide estimates of these movements. With regard to Portuguese emigration, it was shown in Section 2.4 that official statistics are particularly scarce, especially with respect to clandestine emigration, return migration, and repeat migration. In particular, return migration has not been

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[1]Examples are: the reconstitution of a selection of English parishes (see Wrigley & Schofield, 1973); a selection of Swedish parishes (see Danell, 1981; or Sundin, 1984); the province of Quebec (see Gauvreau, 1986); Eidhoven, Netherlands (see Dijk, 1977).

[2]The Tokugawa regime of Japan, which began in 1600, initiated migration registers called zōgenchō, although Samurai and some other groups remained entirely outside the population registration system (Smith, 1977). In Sweden, the Church Law of 1686 called for the recording of in-migration and out-migration in special books; these migration registers were not kept on a regular basis, however, until the early-nineteenth century (Tedebrand, 1976).

studied extensively; most notably, its levels, its impact on the economy, and the demographic structure of the return migrants have been under-explored.

The City of Viana do Castelo provides an ideal opportunity for the investigation of these phenomena through the reconstitution of its population from the abundance of records generated by the Portuguese administrative system. With a population of just less than 10,000 during the nineteenth century, it is large enough to limit the effects of random variation, while not too large to preclude a close examination of the individual level data. Also, its role as the administrative centre and principal port of the District of Viana offers the study of stage migration of the rural peasantry, the migrations of the urban poor, and the migrations of the urban elite. The techniques which enable these movements to be estimated will be discussed in subsequent chapters.

This Chapter describes the reconstitution of the City of Viana and is structured as follows. Section 4.2 covers the economic and demographic history of Viana, and focuses on local and national events in the nineteenth century, in order to establish the circumstances under which the sources being used were created. In Section 4.3 the manuscript sources (muster-rolls, electoral registers, passport books, and cemetery lists) on which the reconstitution is currently based are described in detail. Section 4.4 introduces reconstitution methodology with a brief review of record linkage techniques and studies, and a description of recently-developed software which greatly facilitates the record linkage process. In Section 4.5, the preparation of the Viana data for record linkage is described; this Section covers the problems arising in the use of the manuscript sources, and the standardisation and coding techniques being used to overcome these problems. In Section 4.6, the record linkage of the Viana data is described in detail. Finally, in Section 4.7, the methodological and substantive issues raised in this Chapter are summarised.

4.2 The City of Viana do Castelo

The City of Viana is situated on the northern bank of the mouth of the River Lima which runs westwards through Minho, the northernmost province of Portugal. The City, whose urban centre comprises the two parishes of Santa Maria Maior da Matriz, and Nossa Senhora de Monserrate, serves as the administrative centre of both the Borough and the District of Viana. Historically, Santa Maria Maior, the larger of the two parishes, housed the prosperous trading community of the Town, while fishing activities were centred in Monserrate.

4.2.1 The History of Viana[3]

The ancient Borough of Viana da Foz do Lima[4] (literally: Viana at the mouth of the Lima) was founded by Dom Afonso III on 18 June, 1258 (confirmed in 1262), at which time the settlement itself was elevated to the category of **vila** (town) (Moreira, 1984). By the end of the same century both the church and town walls (surrounding what was later to become the commercial centre of Santa Maria Maior) had been completed (Guerra, 1880).

By the end of the fourteenth century Viana had not grown significantly. Frei Martinho do Amor de Deus, referring to the population living along the bank of the River at that time, wrote that "Viana was a poor town composed of small houses which would more appropriately be described as humble cottages"[5]. José Caldas (1919) elaborates by describing Viana as consisting of only a small community of fishermen and sailors.

The Town's development began with the period of discoveries in the late fifteenth century when economic activities became concentrated around the coastal areas of Portugal. The earliest

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[3] The following history of Viana draws extensively upon that compiled by Reis (1987).

[4] This original Borough covered an area of about 180 km^2 bounded by the rivers Ancora (north) and Lima (south). The parishes to the south of the Lima were incorporated in the Borough of Viana with the administrative reforms of 1835.

[5] Translated from Abel Viana (1953:7).

trade links between Viana and the ports of northern Europe are reputed to have been founded by a Jewish community from Aragon who settled in the Praça Velha[6] - the centre of the Town (Caldas, 1919). Initially, international trade was served by local ships, but over time, foreign vessels became more involved.

Abel Viana (1953) describes Viana during the reign of Manuel I (1495-1521) as having around seventy ships of various types[7], which gave the Town a liveliness comparable with only the most important of European port cities. Writing at that time, Frei Luís de Sousa noted that the nobles of Viana, like those of Venice and Genoa, were engaged in trade and shipping activities, in contrast with most of their contemporaries throughout the rest of Portugal[8]; in the same vein, Flavio Gonçalves writes of the aristocratic seaport of Viana[9]. Trade in silk and porcelain from the Far East, glass from Venice, and fish, sugar, and timber from Brazil (particularly sugar from Pernambuco) enriched the Town, and it soon expanded beyond its walls.[10] Other import-export goods included coal, iron, lime, cotton, leather, cod, rice, salt, wheat, and wine. The growing importance of the Town also led to the development of its watch tower into a small castle[11].

During the sixteenth century, the importance of Viana as a sea port rested on its position at the centre of an important net of commercial activities including long distance trade links with the Far East, Africa, Brazil, and most of Northern Europe (including Russia), together with other Iberian ports such as Aveiro, Figueira da Foz, Lisbon, Porto, Setúbal, and those of Spanish Galicia. The international links, besides providing extensive trading

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[6] Spanish Jews were being persecuted in the late fifteenth century and it was not uncommon for them to seek refuge in Portugal (Livermore, 1966).

[7] There is, however, some disagreement over the number of vessels engaged in specific activities at this time (see Castro, 1979:21).

[8] Cited by Abel Viana (1953:9).

[9] See Sayers (1968:455; cited by Pierson, 1970:459).

[10] The Ruas da Bandeira, Picota, Carreira, and São Sebastião, and the Bairros da Ribeira, São João de Arga, Abelheira, etc. date from this period (Crespo, 1957).

[11] Ordered by the Decree of 1548.

opportunities, were also responsible for the introduction of new crops and industries to the District of Viana[12]. It was at this time that the commercial centre of Viana shifted from the Praça Velha to the Campo do Forno, but smaller merchant businesses remained in the Ruas do Caes and Postigo, and in the Porta Principal.

There is little evidence to suggest that the Spanish domination of Portugal (1580-1640) affected activities in Viana, but the effects of the Wars of Restauração (1640), coupled with increasingly fierce competition from Dutch and English ships for the control of international trade, were responsible for the crisis which first appeared in the mid-seventeenth century.

By the 1680s, however, despite the reduction in importance of the sugar trade with Brazil, signs of recuperation accompanied the beginning of the gold rush in Brazil and the increase in wine and cattle exports to Northern Europe (Moreira, 1984)[13]. With the end of the wars in 1713, Viana's situation improved along with that of the country as a whole; trade flourished again, particularly with Brazil, and another era of prosperity commenced (Crespo, 1957:17).

The Town continued to enjoy this renewed prosperity until the middle of the eighteenth century. Braga (1985) reports that between 1720 and 1741, 1018 ships entered the Port of Viana, of which 10% were Portuguese, 43% English, and 22% French. Of these, 29% were carrying cod from Newfoundland, 26% carried iron, and 12% lime. In comparison, between 1749 and 1774, only 855 ships entered the port, of which 9% were Portuguese, 40% English, and 35% Galician. Of these, 28% carried cod, 26% iron, 6% wheat and less than 2% lime. Besides suggesting a decrease in the volume of trade, these figures clearly demonstrate the dominance of foreign vessels by the eighteenth century, and show large variations in the quantities of particular goods traded. In 1770, Viana imported cattle from Galicia, olives and wheat from Greece, iron from Switzerland, hardware from England, canvas and linens from Russia, and tea from

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[12] Links with Ireland and the Low Countries, for example, resulted in the introduction of the lace industry (Viana, 1953).

[13] The Treaty of Methuen (1703), binding Portugal to admit British cloths on the same footing as before prohibition, and Great Britain to admit Portuguese wines at two-thirds the duty paid for French wines, was partly responsible for this increase in exports. The Treaty is described by Smith (1776).

India. In the same year, its principal exports were corn, oranges, rye, and wine (Loureiro, 1923:25)[14].

Towards the end of the eighteenth century, the pressure of competition from Porto proceeded to erode Viana's status and wealth still further, despite attempts to revitalise the economy by the local bourgeoisie. At the same time, the silting of the bar began to deny the larger more modern ships access to the port (Crespo, 1957). Also, during the early 1770s, as a result of an investigation into contraband trade, the Marquis de Pombal temporarily rescinded the Port's licence to conduct international trade.

The demise of Viana continued into the nineteenth century. Local commerce was ruined by the disruptions of war that followed the French invasions of 1807, 1809, and 1810, and Viana's role as an entrepot port subsequently declined, especially after the independence of Brazil (1822).

Nevertheless, while "there is no doubt that the moment of glory of the Port of Viana was during the period of discoveries" (Sampaio, 1981), Viana entered the nineteenth century as one of the largest towns in the country, and was later even elevated to the status of **cidade** (city) in 1848, when its name was changed to Viana do Castelo[15]. However, before examining nineteenth century Viana more closely, it is necessary to discuss Portugal as a whole, in order to provide a global picture from which to focus.

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[14] Cited by Sampaio (1981:14).

[15] The change in name was associated with the role played by the Town's small castle during the Patuleia War (1846-1847) (Feijó, 1983). Some confusion is unavoidable here - where Viana is referred to in periods before, spanning, or following the year 1848, it will be referred to as the Town, Town/City, and City of Viana, respectively.

4.2.2 Portugal in the Nineteenth Century

It is well known that the upheavals of the French Revolution and Napoleonic conquests affected the pattern of Europe's development deeply. With respect to Portugal, it is unlikely that Trend (1957:175) was exaggerating when he wrote that her recovery from the Napoleonic War took more than a century to accomplish, and an outline of some of the most important events in Portugal therefore forms an essential part of this study, establishing the conjuncture under which the sources described in Section 4.3 were originally created.

First, the flight of Portuguese government to Rio de Janeiro and the extended residence of the monarchy there until 1820 - a direct cause of the French invasions of 1807, 1809, and 1810 - undoubtedly accelerated the inevitability of Brazilian independence which was to deprive Portugal of the fabulous profits enjoyed from the gold and diamonds mined there[16]. Second, a less direct effect of the Napoleonic Empire was the diffusion of liberal ideas which, often proceeding in the form of anti-British sentiment (Silva, 1985:397), culminated in the Revolution of 1820. By the end of the same year, the first version of the constitution had been proclaimed, and Portugal had seen her first parliamentary elections.

The Revolution of 1820 also forced the return of Dom João VI from Brazil in 1821. He left his eldest son Pedro as Regent in Brazil, and brought with him his second son, Miguel.

In the following year, Prince Pedro proclaimed Brazil independent[17], and became its first Emperor. This had an immediate impact on the Portuguese economy; for example, the instant drop in exports of wine to Brazilian markets stirred up unrest in the Minho and Trás-os-Montes (Ruiz, 1980). Such unrest ensured that the constitution elaborated by the elected **cortes** in 1822 did not survive long.

In May, 1823, Miguel led a military revolt, later setting up a new government with his father; the **cortes** was dissolved, and the

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[16] However, the political independence of Brazil by no means produced economic independence, since Portuguese merchants and traders remained important in Brazilian life for a long time, controlling much of the trade (Serrão, 1974:51-52).

[17] Brazil was declared independent on 7 September, 1822.

bulk of the legislation passed by the Liberals was repealed. Further, Miguel, striving to establish a regime untainted by constitutionalism (Nowell, 1952:185), led an abortive **coup d'état** in 1824, resulting in his exile.

Upon the death of João VI in 1826, his son Pedro - the first emperor of Brazil, abdicated the Portuguese throne in favour of his seven year old daughter, Maria da Gloria, and decided that she should marry his younger brother Miguel. He decreed and sent to Portugal a new constitution, the Charter, which Miguel was to accept and swear to maintain. The Charter was, however, very coldly received in Lisboa and the interior, and Miguel, having solemnly partaken in a ceremony of betrothal to Maria da Gloria and sworn by the Charter in Vienna, and having been greeted with popular enthusiasm upon his return to Lisboa in 1828, seized the throne of Portugal[18]. Miguel's absolutist measures swiftly provoked military reaction in Porto, and unrest soon spread to most of the cities north of the Mondego River[19] plunging the country into prolonged civil war (Saraiva, 1978:266).

The ensuing tyranny of Dom Miguel is recorded as having been singularly bloody, scarred by innumerable arrests, deportations, and executions[20], and having instigated a considerable flow of emigration, both politically motivated and otherwise (Oliveira Martins, 1891).

In 1831 Pedro abdicated his Brazilian throne, and set out for the Açores with the intention of restoring his daughter to the Portuguese throne. Less than two years later, in 1833, the Liberals landed near Porto, and in July of the same year they entered Lisboa, meeting little resistance. Miguel was eventually forced to make peace almost a year later, in May, 1834, and was banished by Pedro, who enthroned his daughter Maria before dying later that year.

Thus, a constitutional government, formed around a core of moderate liberals, was finally re-established in 1834. There

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[18] While Caldas (1919:693) states that Dom Miguel was officially unrecognised by the Pope in 1829, Nowell (1952:187) writes that he was given a sort of recognition by many governments, including Russia, France, Spain, the United States, and the papacy.

[19] The Mondego River flows west through the City of Coimbra.

[20] Between 1828 and 1833, 618 political prisoners were jailed (Saraiva, 1978:266), and 115 executions are documented in detail (Oliveira Martins, 1891:179-180).

followed the first phase of liberalism during which the reformist Government focused on political and institutional matters, rather than the economic problems that the country faced (Feijó, 1983:2).

In 1836, the radical liberal Septembristas (as opposed to the Chartistas, who were in favour of Pedro's constitutional Charter), were elected to the north, and a **coup** shortly thereafter brought them to power (without deposing Queen Maria). A subsequent revolt, in 1837, led by the Chartistas' Dukes of Terceira and Saldanha, was suppressed, but the seesaw situation did result in the compromise constitution of 1838 - the third constitution of Portuguese liberalism.

By 1842, under António Bernardo da Costa Cabral, the Chartistas had regained power, and restored the Charter of 1826 once more. But, unpopular progressive reforms imposed by the government of Costa Cabral led to the rising of Maria da Fonte in 1846[21], which spread from the Minho throughout Portugal, bringing the Government's replacement by Septembristas once more.

Tension remained high in the summer of 1846, and broke in October, when a **coup** led by the Duke of Saldanha initiated another civil war - the Patuleia War - which rekindled the bitter rivalries of the 1828-1834 war; Dom Miguel was acclaimed once more. This civil war continued until June, 1847, when Spanish intervention accelerated the end of hostilities, resulting in a further period of political instability, and the return of Costa Cabral.

Only after 1851, when the Government of Costa Cabral fell again, did a stable form of parliamentary rule finally emerge in Portugal, with the Regeneration Party[22] (previously the Chartistas, excluding the followers of Costa Cabral) initially in power, and the Progressive Party (previously the Septembristas) in opposition.

In contrast, the second half of the nineteenth century has been described as disappointingly inert, with the liberals evolving into a

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[21] Modern authors (e.g. Brandão & Rowland, 1980), however, place the roots of the discontent which led to the peasantry's sudden mobilisation as a "headless body, all life and soul, all popular will" (Roby, 1846:20; cited by Villaverde Cabral, 1976), more deeply in the division of property; the key to many of the tensions that existed in the Minho.

[22] The Regeneração has been popularised as the "Portuguese name for Capitalism" after Oliveira Martins (Feijó, 1983:41).

conservative group, and many of the promises of the Liberal Revolution left unfulfilled.

The third quarter of the nineteenth century saw the second phase of liberalism, when some attempts were made to improve the economy, principally through the construction of modern communication and transport networks (Feijó, 1983:2). The period 1851-1865 saw the Regeneration and Progressive Parties in power for six and eight years respectively, after which a coalition cabinet was formed. However, although several bodies of legislation concentrating on the provision of an economic infrastructure were passed between 1851 and 1870, including the property reforms of the early 1860s, and particularly the Civil Code of 1867, by the latter date liberalism was being accused of being incapable of replacing Old Portugal by a new form of life (Feijó, 1983:43).

During the 1890s, political and economic disturbances in Brazil, associated with the proclamation of the Brazilian Republic and the fall in coffee prices, caused a dramatic fall in the exchange. This had a disastrous effect on the value of the remittances from Portuguese emigrants - causing difficulties in obtaining fresh advances for Portugal, reducing the means with which the interest on foreign debts was paid, and leading to the outbreak in Porto in January, 1891. The crisis was aggravated by the British Ultimatum concerning Portuguese interests in Africa (Trend, 1957:181).

In conclusion, nineteenth century Portugal has presented historians with the paradox that amidst some major developments, the Country's economic conditions continued to deteriorate. The most popular reasons put forward for this include the far-reaching effects of the French invasions, the fragile economy that was so heavily dependent on foreign countries[23], the limited effectiveness of the land reforms on agriculture, and, the rigidity and inertia of Portuguese social structure (Mendes, 1980; Reis, 1984).

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[23]Great Britain absorbed 50-60% of Portugal's external produce (Halpern Pereira, 1971).

4.2.3 Viana in the Nineteenth Century

The drop in exports of wine to Brazilian markets in particular augmented the social tension in the Minho and Trás-os-Montes and is deemed to be a factor of great importance in explaining the Miguelista reaction of northern Portugal. At the same time the drop in Brazilian demand for manufactured products (cotton, silk, wool, and iron utensils) increased the fragility of the already retarded development of industry. Furthermore, the situation was made worse by the impotence of the bourgeois in bringing about political and economic reform (Ruiz, 1980:795).

It is not surprising then that the commercial Town of Viana received Pedro's Charter of 1826 as coldly as anywhere, thereby causing an increase in the popularity of Miguel. His return to Portugal in 1828 was greeted with enthusiasm in the Town, as was his visit on 30 March, 1832 (Caldas, 1919).

Three days after troops loyal to the queen entered the Town in March, 1834, the Miguelite administration of Viana was replaced by a temporary interim committee (Feijó, 1983:299).

The radical position of the Town was however reaffirmed in 1846, when the Government headed by Saldanha (replacing the dismissed Government of Palmella which had been appointed during the rising of Maria da Fonte) reinstated many followers of Costa Cabral. At the outbreak of the Patuleia War, Viana adhered to the rebel **Junta** of Porto, relying on the word of honour of the officers of the local garrison that there was no fear of a military revolt in favour of Saldanha. Nevertheless, rebellion within the garrison did break out on 20 October, 1846 (the rebellion of Pinhotes), and military officers took over the administration of the Town (which had fled). Within two days, however, almost 3,000 peasants had surrounded the castle, and the rebels were left with little choice but to negotiate a surrender (Feijó, 1983:323-326).

It is a little ironic then that the inhabitants of the Town were to enjoy the new title of "the City of Viana do Castelo" after 1848, which was awarded because of the valiant defence of the castle by troops loyal to Dona Maria II, defending against Miguelistas!

Returning to Viana's economy, as described in Section 4.2.1 her importance began to decline in the first half of the nineteenth century, a period during which population stagnation could be

identified throughout the Minho. Feijó (1983:54) writes that, in contrast with a rapid national growth, Viana witnessed a decelerating growth until the 1880s, caused by the failure to industrialise, political and military occupation by foreign powers, the continuous fighting that followed the liberal revolution of 1820, and the loss of the Brazilian trade.

The development of technology and good communication and transport systems was notoriously slow. The first (wooden) bridge over the Lima was only completed in 1819, twelve years after its construction was initially approved; this was only replaced by an iron bridge (designed by Eiffel, and still standing today) in 1878 when the railway from Porto reached the City (Filgueiras, 1979). There was extensive resistance to the adoption of the metric system in 1852 (Feijó, 1983:306). Even the harbour at Viana, which had hitherto played such an integral role in the economy of the entire District, suffered from insufficient funds for its profitable development[24], resulting in fears that the trade that remained would be driven elsewhere by increases in the bar-tax. A final illustration is that the streets of Viana were first illuminated using gas lanterns in 1883, more than 35 years after they had been introduced in Lisboa which had by then already benefited from electric lighting for five years[25].

In conclusion, the economy of Viana in the nineteenth century reflected the transition from bustling international port to regional administrative centre. Viana gradually changed from a flourishing town, **"uma nova Lisboa"** (a new Lisboa) according to Frei Luís de Sousa[26], part of one of Portugal's most prosperous regions, to a peripheral and backward town, incapable of competing with Porto as a port city.

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[24] A Aurora do Lima (12 May, 1880).

[25] Viana: A Aurora do Lima (1 April, 1883); Lisboa: Serrão (1970).

[26] Quoted by Crespo (1957:16).

4.2.4 The Population of Viana

This Section describes the overall trends in the population of Viana to the end of the nineteenth century. Early sources are rare and therefore, after a brief introduction, evidence from the four censuses of 1864, 1878, 1890, 1900 is examined. The following summary will also serve as a reference point for the micro-analyses of the reconstituted population of Viana that are presented throughout the rest of this study.

The enumeration of 1527 refers to 962 households and 3,800 inhabitants of the Town and its surrounding area, a relatively high figure for the time, with 679 households of fishermen and sailors in Monserrate, compared with 146 in Santa Maria Maior (Crespo, 1957).

Moreira (1984) identifies three distinct periods of demographic change during the sixteenth and seventeenth centuries: 1517-1580 and 1580-1640, during which the population increased by 86.5% and 109% respectively, and 1640-1707, the period coinciding with the first economic crisis in Viana, during which the population decreased by 31%. Thus, while there is no record of plagues or wars having had any great demographic impact, the effects of economic crises on mortality and out-migration are likely to have been important.

In fact, Viana's commercial role was both the cause and effect of its demographic growth, and so, with its decline during the late eighteenth and early nineteenth centuries, out-migration assumed greater importance than ever before.

The populations of Viana recorded at the censuses taken during the nineteenth century are shown in Table 4.1; the figures show that while the population of Santa Maria Maior increased at each point, the population of Monserrate varied considerably.

Table 4.1 The Population of Viana in the Nineteenth Century

	Santa Maria Maior			Monserrate		
	Population	Households		Population	Households	
Year	(1)	(2)	(1)/(2)	(1)	(2)	(1)/(2)
1801	4,825	1,075	4.49	2,444	661	3.70
1864	5,333	1,185	4.50	3,930	868	4.52
1878	5,450	1,211	4.50	3,366	846	3.98
1890	5,590	1,253	4.46	4,092	979	4.18
1900	5,625	1,222	4.60	4,467	917	4.87

Since part of the growth between 1801 and 1864 can be attributed to the large under-registration of the 1801 census[27], it can be seen that Viana experienced very little demographic growth during the nineteenth century, barely achieving a population of 10,000 by 1900. This also suggests that there was little urbanisation in the District of Viana, as the natural increase in the population of the surrounding area must have been mostly absorbed by out-migration. Finally, the figures demonstrate that Monserrate grew far more than Santa Maria Maior during the period. Unfortunately however, no information on the availability of housing and accommodation is available for an analysis of the details of this growth.

The population of the City can be examined in more detail using information from the censuses of 1864 and 1878 which, unlike those of 1890 and 1900, give the sex/age/marital status distributions of the population by parish as well as borough and district. Table 4.2 shows these populations cross-classified by sex and marital status.

Table 4.2 The Population of Viana, 1864, 1878

| | Santa Maria Maior | | | | Monserrate | | | |
| | Males | | Females | | Males | | Females | |
	1864	1878	1864	1878	1864	1878	1864	1878
Single	1430	1594	2054	1958	1302	823	1249	1172
Married	700	788	736	713	552	535	559	574
Widowed	112	106	301	291	64	67	204	195
Total	2242	2488	3091	2962	1918	1425	2012	1941

The figures show that although the male population of Santa Maria Maior increased by 11% between 1864 and 1878, that of Monserrate decreased by 26%. In contrast, the female populations of both parishes decreased by about 4%. This is surprising as it cannot be explained by the under-registration suspected to exist in the 1864 census, since one would expect such under-registration to have affected the female population more than the male, and under these circumstances an apparent growth rather than decline in the number of females present by 1878 would be seen; of course, there could have been more under-registration in 1878, but there is no evidence to

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[27] Described in detail by Reis (1987:98).

suggest that this was the case. What is more likely, particularly since the changes are concentrated in the unmarried population, is that there was movement of males from Monserrate to Santa Maria Maior, perhaps for occupational reasons, during the inter-censal period. However, the extent to which out-migration from Monserrate to other destinations might be disguised by in-migration from other origins to Santa Maria Maior cannot be assessed from these data. An examination of the age distributions of the populations of the two parishes will throw further light on this hypothesis of intra-urban migration.

The information on the age distribution of the **de facto** population, however, presents three major difficulties: two general, and the other peculiar to Viana. First, since the data suffered considerable age-heaping and were published using different age groups, it is often necessary to regroup and smooth the data for comparative purposes. Second, because the censuses were taken 14 years apart, the calculation of measures such as survival ratios from the five-year age groups still requires care. Third, 383 single males in the 21-25 year age group were recorded as being permanent residents of Monserrate in 1864. Reis (1987:262-266) concludes that this extraordinarily high figure must have been a reporting error, whereby some of the population temporarily resident in the City had been accidentally enumerated as permanent[28]. Thus, the true number of single males in the 21-25 year age group is estimated to be 158, using information from the two adjacent age groups.

Since problems of age heaping are not of primary interest in this research however, the data have been regrouped into ten-year age groups centred about ages ending with the digit 0; therefore, only large misstatements resulting in movement between these age groups will not have been eliminated. Figures 4.1 to 4.6 show the population pyramids for the two parishes separately and then for the

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[28]This is plausible if the over-count resulted from occupation of the local castle by a military garrison in 1864 which was no longer present in 1878, at which time there is no evidence for a large number of young single males in either the **de juro** or the **de facto** population. However, electoral registers for the parish of Monserrate indicate that the garrison was still present in 1878.

whole City in 1864 and 1878[29]; the data are reproduced in Appendix 4.A, and are also summarised in Table 4.3 using just three age groups in order to facilitate comparisons between the age group including the main working ages, and the young and old, many of whom were dependent on that group.

Table 4.3 The Population Age Distribution of Viana, 1864, 1878 (%)

| Age | Santa Maria Maior | | | | Monserrate | | | |
| | Males | | Females | | Males | | Females | |
	1864	1878	1864	1878	1864	1878	1864	1878
<15	37.2	30.6	28.1	24.5	32.6	38.8	30.1	27.4
16-40	33.9	43.7	32.1	34.5	42.1	33.2	34.3	34.8
≥41	28.7	25.6	39.8	41.0	25.1	27.9	35.6	37.8

Source: Reis (1987:272)

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[29]The pyramids are presented with the female population to the left, and age groups <1, 1-5, 6-10, 11-15, 16-25, 26-35, 36-45, 46-55, 56-65, 66-75, and ≥76. The dashed lines appearing for males in the age group 16-25 in the pyramids of Monserrate and the total population represent the figures adjusted for the reporting error discussed earlier in this Section.

Figures 4.1 to 4.6 Population Pyramids, Viana, 1864 and 1878
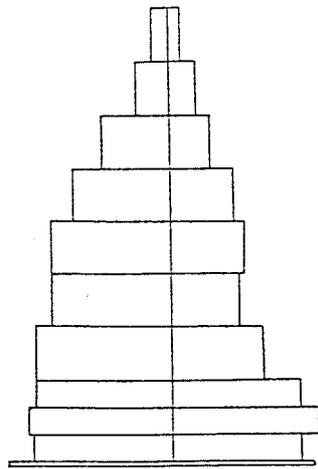
Figure 4.1 Santa Maria Maior, 1864
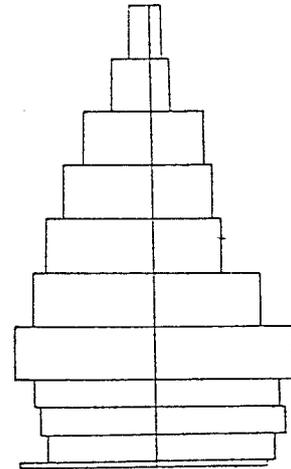
Figure 4.4 Santa Maria Maior, 1878
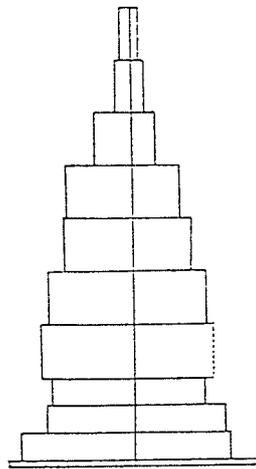
Figure 4.2 Monserrate, 1864
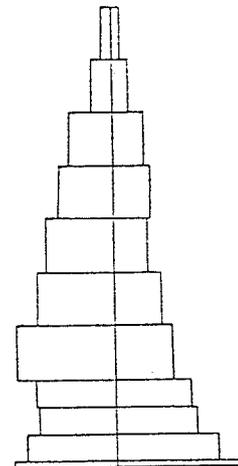
Figure 4.5 Monserrate, 1878
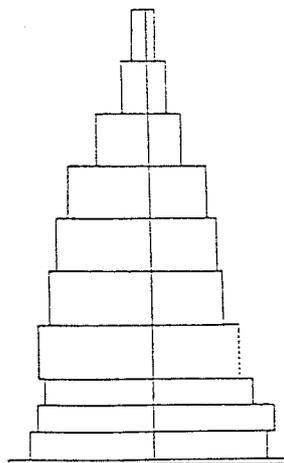
Figure 4.3 Viana do Castelo, 1864
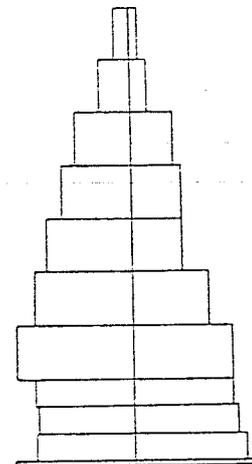
Figure 4.6 Viana do Castelo, 1878

The figures in Table 4.3 also suggest that there was some movement of males aged 16-40 from Monserrate to Santa Maria Maior. In contrast, the female distributions are very similar. These observations are shown far more clearly in Figures 4.1 to 4.6. A comparison of Figures 4.4 and 4.5 suggests that the movement of males was concentrated in the 26-35 year age group[30]. In addition, there was considerable in-migration of females aged 16-25 to both parishes. Finally, Figures 4.3 and 4.6 also demonstrate two other phenomena: first, the reduction in random variation achieved by combining two smaller sets of data; and second, that it would be a mistake to place too much importance on analysing the populations of Santa Maria Maior and Monserrate separately, because, although socio-economic differences did no doubt to some extent exist, the close relationship that the parishes enjoyed will have reduced them.

The analyses of Reis (1987), using the regrouped and smoothed data, and performed for each of the two parishes separately[31], suggest that the demographic regime of the City differed little from that of its hinterland, with low natality and general fertility, low proportions marrying and high mean ages at marriage among those who did marry, relatively light mortality, and finally, substantial levels of emigration.

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[30]A rough estimate of the survival ratio for Santa Maria Maior males (assuming no migration) from 1864 to 1878 of the cohort aged 16-25 in 1878 is 0.95, a very high figure for a nineteenth century society, provides further evidence that the increase in the number of males between 1864 and 1878 can be attributed to in-migration of young males.

[31]The justification for studying the two parishes of the City of Viana separately lay in the pronounced socio-economic differences identified between the populations of Santa Maria Maior and Monserrate. However, the differences are somewhat exaggerated in the comparison of occupational structures presented by Reis, since this does not compare the whole parishes but only the commercial hub of Santa Maria Maior with the fishing community of Monserrate.

4.2.5 Migration To and From Viana

Very little direct evidence of in-migration to, or out-migration from Viana exists at all. Nevertheless, indirect evidence of migration is available from manuscript sources, and both indirect and inferential evidence of migration is available from aggregate data. For example, indirect evidence of in-migration is provided by birthplace information, which was usually recorded on vital registration and other documents[32]. Also, some indirect evidence of out-migration is provided from 1835, when a record of all passports issued began to be kept. In this Section however, attention will remain focused on aggregate data, using the evidence available from the censuses of 1864, 1878, and 1890.

4.2.5.1 In-Migration to Viana

The earliest evidence of in-migration is that provided by Caldas (1919) on the settlement of a Jewish Community in Viana in the fifteenth century (see Section 4.2.1).

In the nineteenth century, the census of 1890 was the first to collect information on birthplace. Table 4.4 shows the relevant figures; the population is classified as resident in: a) the borough in which they were born, b) another borough of the same district, c) a different district of Portugal; and d) the number of foreigners.

Table 4.4 Birthplace (%) of the Population, 1890

Administrative Area	Same Borough	Same District	Other District	Other Country
Santa Maria Maior	71.9	14.4	11.8	1.9
Monserrate	70.1	11.1	14.7	4.1
Viana (City)	71.2	13.0	13.0	2.8
Viana (Borough)	92.2	3.6	3.5	0.7
Viana (District)	94.6	2.9	1.8	0.7
Portugal	89.0	4.2	6.0	0.8
Porto (City)	55.7	12.3	27.9	4.1
Lisboa (City)	50.6	8.8	35.2	5.4

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[32]For example, the birthplaces of both parents and all four grandparents are often available on Portuguese baptismal records.

Although the figures may to a slight extent be affected by differential out-migration, they suggest that there was a modest level of in-migration to Viana, especially as it is to be borne in mind when examining the attraction of the City of Viana in comparison with Porto and Lisboa, that the populations of the three cities were at the time about 10, 140, and 300 thousand respectively. It is interesting to note that in-migrants to Viana who were resident in Monserrate are slightly more likely to have been born further afield than those who were resident in Santa Maria Maior.

4.2.5.2 Out-Migration From and Return Migration To Viana

The earliest evidence of out-migration is that provided by Moreira (1984), that emigration from Viana first appeared in 1647 when twenty families left the Town during the period of economic crisis (see Section 4.2.1).

For the nineteenth century, the population pyramids of the 1864 and 1878 censuses can be used to indicate net migration. Figures 4.1 to 4.6 suggest that while in 1864 the male population of Santa Maria Maior had clearly experienced heavier net out-migration than that of Monserrate, by 1878 the evidence for this has been removed by the in-migration of Monserrate's out-migrants! This corroborates the findings of Reis (1987), who, using the age-specific sex-ratios, demonstrates that the level of male absence was high for the working population of Santa Maria Maior in 1864, and, using the survival ratios, that out-migration of males from Monserrate was important during the inter-censal period.

Also, an extremely crude assessment of what might be evidence of return migration can be made from Table 4.5 which shows the population who were recorded as temporarily absent at the time of the census enumerations of 1864 and 1878.

Table 4.5 The Temporarily Absent Population of Viana, 1864, 1878

| | Santa Maria Maior | | | | Monserrate | | | |
| | Males | | Females | | Males | | Females | |
	1864	1878	1864	1878	1864	1878	1864	1878
Single	76	120	31	43	365	110	19	30
Married	36	38	5	10	140	65	8	11
Widowed	3	2	0	1	3	1	0	2
Total	115	160	36	54	478	176	27	43

The figures once again suggest a reversal of trends in the male population between the two parishes during the inter-censal period. While the number of temporarily absent single males increases in Santa Maria Maior, the number of both single and married decreases in Monserrate. This provides further evidence for changing socio-economic patterns in the two parishes, probably reflecting the decline in the seagoing activities of Monserrate, and a movement of males to Santa Maria Maior seeking employment in the commerce, or in the rapidly expanding administrative functions of the parish. For women, the figures are far more stable, with a general increase in female absence.

These figures, of course, do not indicate how many may have left the City with no known intention of returning. Reis (1987) therefore extends the above analysis by applying model life-table sex-ratios; using an assumption of negligible female migration[33], she derives estimates of numbers and proportions of net male absences at each of the 1864 and 1878 censuses. These estimates are displayed in Table 4.6; the numbers and proportions for the City as a whole are not presented by Reis, but have been included in the Table[34].

Table 4.6 Number and Proportion (%) of Net Male Absence, 1864, 1878

	1864		1878	
	15-34	35-59	15-34	35-59
Santa Maria Maior	490 (68)	220 (52)	163 (16)	180 (41)
Monserrate	162 (24)	115 (38)	373 (83)	139 (52)
City of Viana	652 (47)	335 (46)	536 (36)	319 (46)
Borough	2511 (42)	1332 (41)	2544 (41)	1360 (40)

Source: Reis (1987:289)

As stressed by Reis, the estimates are not of migration itself, but of net population movements. Also, no precise period of initial

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[33] While the assumption that females constituted a far less mobile population than males is certainly justified with respect to emigration (the proportions of females among nineteenth-century Portuguese emigrants are extremely low), too little is known about internal migration flows to warrant its general application. It will be shown in Section 6.2, that female in-migration to the City of Viana was substantial, and female out-migration was far from negligible.

[34] Net male absence from the City has been calculated as the weighted mean of absences from the two parishes of Santa Maria Maior and Monserrate.

absence can be identified, since knowledge is restricted to the net number of males absent at a particular point in time, irrespective of when they went. Nevertheless, the figures suggest that there was a substantial amount of male out-migration, and that while the net absence of males from the Borough changed little during the period, there was a marked decrease in the net absence of young males from the City. Comparisons between the parishes are once more confounded by the movement of males from Monserrate to Santa Maria Maior.

4.2.5.3 Summary

It is not possible to draw a detailed picture of migration flows to and from Viana because very little is known about the various components of these flows. In-migration is known to have been substantial, since almost 30% of the population of the City were non-natives of the Borough in 1890. But, out-migration, both to other parts of Portugal and emigration from Portugal, have hitherto remained unquantified. However, the evidence presented in this Section suggests that out-migration played a considerable role in the population stagnation of nineteenth century Viana identified both throughout the surrounding area by Feijó, and in the City itself by Reis. Further, the high levels of emigration which are known to have operated throughout north-western Portugal during the second half of the nineteenth century are likely to have accounted for a substantial amount of out-migration. Nevertheless, out-migration to other parts of Portugal, particularly Braga and Porto, the two nearest most important urban centres, is also likely to have been important.

4.3 The Manuscript Sources

This Section will describe the manuscript sources on which the
the reconstitution of Viana is based: the muster-rolls of 1826-1833,
the electoral registers of 1834-1931, the passport books of
1835-1896, and the cemetery lists of 1855-1922.[35] Examples of these
four sources are presented in Appendix 4.B.

A range of other sources are also being used for the complete
reconstitution of Viana: parish records of births, marriages, and
deaths[36], military recruitment registers, and notarial records, but
their use lies outside the scope of this study. It is worth noting
here that although Portuguese confessional roles are known to exist,
sometimes providing virtually continuous population registration,
none have yet been discovered for Viana.

4.3.1 The Muster-Rolls, 1826-1833

Muster-rolls[37] have been drawn up in Portugal since the
mid-seventeenth century, when Portugal regained her independence from
Spain. Those drawn up between 1826 and 1833 were governed by the
precise legislation of 1812[38], and are the only systematically
collected source of demographic data available for Portugal in the
period 1820-1835 (Serrão, 1973:117). They are household listings

 - **Registos de Fogos e Moradores** - each covering one Company of a
military district; the limits of these districts corresponding
closely with those of the **ancien régime** boroughs. Where more than

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[35] Since the creation of each source was governed by various bodies of legislation, the
indices compiled by Lencastre (1869) and Vasconcellos (1930) were consulted in order to identify
important changes which could then be investigated in detail from primary sources. Except where
otherwise indicated, references to legislation are from these sources.

[36] These are available after 1536 when the resolution that each church should keep a book of
baptisms and deaths was passed (Alarcão, 1983:22).

[37] In a previous paper (Kitts et al, 1987), the muster-rolls of Viana were referred to as
militia lists. The current description is adopted to reflect more accurately their local nature.

[38] Although the 1826-1833 muster-rolls were initiated just before, and updated during, the
reign of Dom Miguel, there is no record to indicate that he was instrumental in their creation.

one hearth existed in a house, each was distinguished by a letter of the alphabet.

The military District of Viana comprised 12 Companies: four in the Town itself, one including part of a road in Santa Maria Maior, the rural settlement of Abelheira in that parish, and the whole of the parish of Meadella (about 1km to the east of the Town, up the Lima valley), and the rest covering other surrounding parishes to the north of the River[39]. The First Company covered the commercial centre of Santa Maria Maior, an area enclosed by the old town walls; the Third Company covered the area of Monserrate bordering the River, mainly comprising the fishing community; and the Second and Fourth Companies covered the rest of the Town, excluding part of the Rua da Bandeira which was included in the Fifth.

Unfortunately, under the legislation of 1812, those included on the rolls did not constitute the entire population, as spinsters and widows who were not heads of households and who did not have male children were not included. The rolls thus comprise: first, all males; second, females who could affect a male's liability for recruitment (wives, and single or widowed mothers); and third, since every household had to be registered, female heads of households where no males resided.

For each male inhabitant, name, marital status, date of birth (or age in years), birthplace, and father's name were consistently recorded; only name and marital status were generally recorded for females. Any further information relevant to potential military service was later entered in an observations column by the scribe. Such information typically included notes on an individual's availability for recruitment, changes of address both within and between military districts, departure elsewhere, and death.

These extra observations, together with information on individuals entering the list after its initial creation were written

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[39]The other seven companies of the District of Viana covered the following parishes: Sixth Company, Areosa and Carreço; Seventh Company, Carreço and Afife; Eighth Company, Soutello, São Pedro and Âncora; Ninth Company, Vilar, São Lourenco and Amonde; Tenth Company, Nogueira and Cardiellos; Eleventh Company, Outeiro and Perre; and Twelfth Company, Santa Marta and Serreleis. Only Meixedo, Torre, and Vila Mou, the other three parishes of the **ancien régime** Borough of Viana are not included in any of the twelve companies.

in different inks, by clerks with different styles of handwriting, often making it possible to distinguish between them.

4.3.2 The Electoral Registers

Electoral registers were first drawn up in Portugal according to the Decree of 9 January, 1834; passed by the liberals more than four months before the final surrender of Dom Miguel. The legislation stipulated that elections for members of a **Câmara** (municipal chamber)[40] were to be held annually in every borough. The electoral registers themselves were to be drawn up by parish, differentiating between those only eligible to vote, and those also eligible to be elected. They were revised annually until 1878, but less frequently thereafter. The registers of Santa Maria Maior and Monserrate for the following 54 years are considered here: 1834, 1835, ... , 1878, 1880, 1881, 1883, 1888, 1891, 1894, 1895, 1911, and 1931.

A major problem immediately arises in the use of these registers, however, since an individual's appearance on them depended on political rather than demographic considerations. In order to identify the electorate, and more particularly, its relationship with the population from which it was drawn[41], it is necessary to review the legislation governing the creation of these data.

Fortunately, membership of the electorate depended little on social groupings such as class or occupation, that as a rule mattered most, but rather to the observance of rules applied nationwide whose relevance to the local community could be minimal (Feijó, 1983:293-294). However, electoral legislation was nevertheless changed frequently between 1834 and 1851 amidst the political turbulence of the first phase of Portuguese liberalism, and it was only after this latter date that a certain stability in both the

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[40]Although every borough had a **Câmara**, the process of formation and the attributes of each varied enormously; what a **Câmara** could and could not do was a combination of legal disposition and custom (Feijó, 1983:294).

[41]Brandão & Feijó (1984) warn the researcher of the "truncated image of a society subject to artificial divisions which altered a lot over time" offered by these registers.

political climate and the electorate on which it relied is deemed to have emerged (Feijó, 1983:301).

Essentially, the electoral legislation of nineteenth century Portugal, like that of many other countries, was based upon the idea that the "active citizen" was the foundation of the state. Those who triumphed in 1820, when the first version of the constitution was proclaimed, and who remained victorious after 1834, were careful to define the elector as an independent, settled man of property (Silbert, 1977)[42].

While the earliest electoral legislation simply stated that an elector should have an income of 200$000 **reis** derived from landed property, commercial activity or employment (Constitution of 1826), subsequent measures provided for the detailed computation of a man's income from a variety of fiscal documents. The Law of 27 October, 1840, stipulated that the commission charged with the compilation of the electoral register should consult the tax records, to verify that an elector had made a payment of 10$000 **reis decima** on incomes received from the local authorities or the **Casa da Misericórdia,** or had paid a tax of 5$000 on property rents owed to him, or 1$000 **reis** property tax on his own residence, or on income derived from his own enterprise.

In addition, stipulations that the level of cash should be earned in a consistent manner by a resident of long standing were designed to keep the electorate free of the urban journeymen whose activities in times of crisis in 1836 and 1838 had proved a potent threat to the regime[43]. An elector's residence, defined as "that part of the country where he resided for the greater part of the year", also provided against the possibility that politicians might influence the outcome of elections by the judicious mobilisation of state officials[44].

The administrative reforms of the 1840s also provided for the 40 major taxpayers of the Borough to play a consultative role in local

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[42]The Law of 9 January, 1834, provided that elections be conducted according to the instructions set out in the Constitution of 1826.

[43]Urban journeymen had played a major role in the rising of September, 1836 (Peres, 1935).

[44]Law of 27 October, 1840 (**Legislação Portuguesa,** 1840).

affairs - the committee of scrutineers who met every year (usually in July) to draw up the electoral register[45]. These scrutineers possessed the right to inspect the qualifications of those who did not produce evidence from the Town's fiscal records, and were responsible for verifying whether other "proofs of income" were acceptable equivalents to the tax returns[46]. They were also empowered to exclude those who were too young and did not possess the appropriate educational qualifications, those who worked in personal or domestic service, and freedmen, regardless of wealth.

The 40 largest tax payers continued to play a major role in the formation of the electoral rolls throughout the 1850s and 1860s, buttressed by their preeminence in the **Câmara**[47]. Their position was retained in the bodies of legislation introduced in the 1850s: The financial calculations were amended in 1852 to allow a prospective elector to demonstrate that he possessed sufficient income by having paid 1$000 **reis** in the new 4% property tax levied on personal residences[48]. These tax considerations were further modified with the progressive legislation of 1859, which provided for the inclusion of two new taxes; the **decima industrial** and **contribuição predial**[49].

Only after 1878 was the electorate broadened to include literate heads of households, and income qualifications abolished[50]; a process completed by 1883[51]. Also, by this time the registers were compiled by the municipal authorities, without interference from scrutineers.

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[45] Administrative Code of 18 March, 1842 (**Legislação Portuguesa**, 1842).

[46] Members of the regular clergy, graduates of Coimbra University, those with formal qualifications from another University, polytechnic, or lycée, and teachers in secondary schools or higher education were dispensed such proofs of income, subject to the scrutiny of the committee. Law of 30 September, 1852, Art.7, III-VIII (**Legislação Portuguesa**, 1852).

[47] The restrictions on eligibility for election, far stricter than those governing the right to vote, ensured that the **Câmara** was essentially composed of members of the local aristocracy and businessmen, and not "the people" (Feijó, 1983:298).

[48] Law of 30 September, 1852 (**Legislação Portuguesa**, 1852).

[49] Law of 23 November, 1859, Art.2 (**Legislação Portuguesa**, 1859).

[50] Law of 8 May, 1878 (**Legislação Portuguesa**, 1878).

[51] Law of 4 April, 1883 (**Legislação Portuguesa**, 1883).

In 1895 and 1896, however, the franchise was again restricted, so that only those who could read and write, and were paying at least 500 **reis** directly to the state qualified to be electors automatically, while anyone meeting the literacy requirements but not the financial ones merely had the right to petition personally for the right to vote[52].

Before the proclamation of the Portuguese Republic in 1910, there was a further widening of the electorate in 1899, and a narrowing in 1901[53].

After the proclamation of the Republic, the electorate was broadened to include all Portuguese citizens over the age of 21 who could read and write, or who were heads of a households[54].

By 1931, the most recent year for which electoral registers are considered, this legislation had been modified such that those who could not read and write were to have paid at least 100$00 escudos in taxes; also, females over the age of 21 with certain qualifications were allowed to vote[55]. However, the register of 1931 must be approached with some caution, because it was compiled under dictatorial rule[56].

In summary, the most important bodies of legislation are shown in Table 4.7, classified according to whether they were progressive - widening the franchise - or regressive - narrowing the franchise.

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[52] Laws of 28 March, 1895, and 21 May, 1896 (Legislação Portuguesa, 1895; 1896).

[53] Laws of 26 July, 1899, and 8 August, 1901 (Legislação Portuguesa, 1899; 1901).

[54] Law of 14 March, 1911 (Legislação Portuguesa, 1911).

[55] Laws of 2 March, 1928, and 27 December, 1933 (Godinho, 1969).

[56] General Carmona carried out the military **coup** of 1926. By 1929, he was giving way to his Minister of Finance - António de Oliveira Salazar (Thomson, 1962:633).

Table 4.7 Portuguese Nineteenth-Century Electoral Legislation

Date			Effect	Government
7	8	1826	Regressive	Trigoso Morato
4	6	1836	Regressive	Duque de Terceira
8	10	1836	Progressive	Passos Manuel
5	3	1842	Regressive	Costa Cabral
30	09	1852	Progressive	Duque de Saldanha
23	11	1859	Progressive	Duque de Terceira
8	5	1878	Progressive	Rodrigues Sampaio
28	3	1895	Regressive	Hintze Ribeiro; João Franco
21	5	1896	Regressive	Hintze Ribeiro; João Franco
26	7	1899	Progressive	José Luciano de Castro
8	8	1901	Regressive	Hintze Ribeiro

Source: Serrão (1976)

It is noted that two important bodies of legislation do not appear in the table. First, the progressive constitution proclaimed after the Revolution of 1820, under which Portugal held its first parliamentary elections. Second, the progressive decree of 1834, which provided for regular parliamentary elections and the compilation of the necessary electoral registers.

Finally, with regard to the information recorded on the electoral registers, it is important to bear in mind that this varied from year to year according to the legislation. Name, age, marital status and occupation are recorded on almost every register[57], together with one or more indicators of income (either direct or indirect). Road of residence is recorded on the first three rolls, while birthplace is recorded on four subsequent rolls. A number of other observations such as literacy, whether the elector was the head of a household, whether he was eligible to be elected, whether he had performed jury service, etc., appear at various times during the period. A detailed description of the data recorded on the electoral registers is presented in Appendix 4.C.

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[57]Only names were recorded on the registers of 1837-1839, and marital status was also omitted from the registers of 1840.

4.3.3 The Passport Books

Legislation passed in 1835 provided that passports for travel outside Portugal were to be issued by the Civil Administration of each district at a price of 800 **reis**, the particulars of each passport issued being recorded in passport books. The District Administration of Viana do Minho issued its first passport under this legislation on 8 October, 1835.

The first passports carried the name of the holder, his birthplace, marital status, and occupation, his destination, the name of the individual declaring himself responsible for the application (this item was dropped during the 1850s), and a number of descriptive particulars concerning age, height, face, hair, eyebrows, eyes, nose, mouth, colour, and any other distinguishing features. In addition, the date of issue was recorded, together with the length of time for which the passport was valid (usually 60 days), and the signature of the official issuing the passport. Space was also provided for the recording of the intended travel itinerary (port of embarkation, etc.), but this was rarely used. This basic structure soon evolved to include the passport holder's current place of residence, his father's name, space for the inclusion of information regarding individuals accompanying him. Much later, in 1927, passport photographs began to appear.

Only the most important items of information are considered here: birthplace, sex, name, age, marital status, occupation, date of issue, and destination. These are available for the 1,854 people who appear on the 1,522 passports issued to residents of the Town/City of Viana before 1896, when changes in the recording of information made it difficult to accurately ascertain current place of residence.

4.3.4 The Cemetery Lists

The repeatedly delayed adoption of public cemeteries in nineteenth century Portugal lies rooted in the population's reluctance to abandon traditional burial practices, such as within the walls of churches. Attitudes to death and burial in the Minho are discussed in detail by Pina-Cabral (1986:214-226); and their effect on the introduction of public cemeteries in the Borough of Viana is discussed by Feijó (1983:316-322).

Although the first national bill on the subject was passed in 1835[58], it was not until December, 1840, that the first public cemetery was opened in Viana, and then the public discontent and careless manner in which it was maintained led the Civil Governor to order its closure just eighteen months later.

This slow progress led the Government of Costa Cabral to pass the Health Laws of 1844 which sought to tighten control over burial practices by including measures, amongst others, forbidding burial in churchyards and ordering them to be interred at some distance from villages. However, as mentioned in Section 4.2.2, violent protest was precipitated, and some authors (e.g. Nowell, 1952:196) go so far as to suggest that the revolution of Maria da Fonte was caused principally by peasant reaction to these laws.

In fact, it was only in 1855, when cholera threatened the City of Viana killing 95 people in the parish of Santa Maria Maior alone, that a new public cemetery was inaugurated (Castro, 1954; 1955). The first entry in the cemetery lists of Viana was made on 24 September, 1855.

The lists record the name, father's name, birthplace, marital status, occupation, date and place of death of the deceased, together with the date on which they were buried and a number identifying where they were in the cemetery.

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[58] The Decree of 20 September, 1835, stipulated that: cemeteries were to be provided (Art.1), they were to be built outside city, town, or village limits (Art.3), that they were to be surrounded by a wall about 10 hands high (Art.4), and that a separate grave was to be provided for each corpse (Art.5). The Decree of 8 October, 1835, further ordered that: parish and borough authorities were to be responsible for the upkeep of cemeteries (Art.1), and that the corpses of people who had had an annual income of less than 100$000 reis, or who had not been electors, were to be buried at no cost (Art.3).

Considering the use of the lists, two caveats arise. First, information concerning age at death was initially omitted, thus exacerbating the difficulties of reconstitution. This problem is alleviated, albeit only slightly, from 1863, when separate books began to be kept for minors (aged <14 years) and adults (aged ≥14 years), and removed completely from 1879, when age at death was included. Second, the census of 1862 specifies four places in which people could be put to rest, namely plots in public cemeteries, private vaults in public cemeteries, private vaults elsewhere, and the church. However, those who chose the latter two were by this time mainly monks, nuns, and important aristocrats.

In view of these drawbacks, it is necessary to justify the use of the cemetery lists rather than the death records which probably cover all deaths, include information on age at death, and are available for each parish separately throughout the period on which this study focuses. First, the cemetery lists have the practical advantage of actually being lists (i.e. information on each individual is arranged in columns) and being available in photocopied form, while the death records are less structured and are only held on microfilm. Second, it is believed that the items of information available on the lists combined with the knowledge that an entry thereon ought not to precede any entries on the electoral registers or in the passport books are sufficient to minimise the likelihood of incorrect linkage with records of the early lists on which age did not appear. Finally, the number of deaths for which death records but no entry on the cemetery lists exist is believed to be negligible since a comparison of several years of both sources yielded little disparity[59].

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[59] By the same token, of course, this suggests that the number of deaths not recorded on the parish registers of Viana is small.

4.4 Record Linkage

In philosophy, great distinction is drawn between knowledge by acquaintance and knowledge by description, where the importance of the latter is that it enables people to pass beyond the limits of their private experience. Russell (1912:31) gives the example that given the knowledge that "Bismarck was an astute diplomatist", one would like to affirm, when describing Bismarck as the first Chancellor of the German Empire, that "the first Chancellor of the German Empire was an astute diplomatist". This process involves the acceptance that the objects referred to (Bismarck) are in fact the same, and therefore constitutes an increase in knowledge using record linkage. In this way, most knowledge is by description, and in particular, historical knowledge is entirely by description, leading Winchester (1972) to write that "History is speculation about the past controlled by record linkage".

Record linkage then, although often not identified as such, is a fundamental human process that has long been applied. The twentieth century, however, has seen its development as a technique for the identification of large numbers of persons from any number of different types of records, and its application in various fields including commerce, demography, genetics, and medicine. In historical demography, record linkage is most commonly associated with the family-reconstitution techniques which, although often attributed to the pioneering efforts of Marcel Fleury and Louis Henry in the 1950s, were applied as early as the 1910s in Sweden (Åkerman, 1982:187). More recently, the availability of larger and more powerful computers make fully automatic record linkage possible. This has encouraged the development of many large scale projects; however, the majority of these remain overshadowed by the work of the Demographic Data Base at Umeå University, Sweden[60]. Thus, in the last three decades, the need for formalisation of techniques has led to the generation of a wide, varied, and interesting body of literature on the subject of record linkage. Reviews of this literature are provided by Winchester (1973b; 1974; 1985).

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[60] See Danell (1981), or Sundin (1984) for a description of the Demographic Data Base at Umeå.

This Section reviews current practices and introduces recently-developed software which facilitates the record linkage process. First, a brief review of the literature focuses on the problems of record linkage in historical demography in order to identify the software requirements of record linkage. Second, the data base management system SIR is described, and its ability to meet the software requirements of record linkage is demonstrated. Finally, record linkage using SIR is described in more detail.

4.4.1 Issues in Record Linkage

Record linkage might initially be defined as the process whereby pairs of records, one from each of two files of records, are compared in order to ascertain whether they both relate to the same person; if there is sufficient agreement between the records along some predetermined criteria, the records are linked, otherwise they are not. This definition, however, becomes unsatisfactory when two or more records in one file contain identical sets of information, or more than two files of records are being considered. In the former case, it is usually impossible for two records in one file to refer to the same person. In the latter case, given three records, A, B, and C for example, A may be linked to B, whereupon consideration of C reveals that while B and C ought to be linked, A should not be linked to this pair. Thus, record linkage comprises the problem of deciding whether two records might match, and where more than one possible match exists, the problem of deciding which match is better. This naturally extends to higher order problems where clusters of possible matches exist. Increases in dimensionality are discussed later, but first, attention is restricted to comparisons of pairs of files of records.

Having defined record linkage as above, the problem reduces to one of calculating some measure of consistency between any two records under consideration. Further, since each record comprises an unspecified number of identifying items, or fields, such a measure can be calculated from similar measures of consistency between each pair of fields. This approach is illustrated with two trivial examples: On the one hand, if the sex fields of two records are compared, then either they are the same, in which case they are

completely consistent, or they are not, in which case they are completely inconsistent and the comparison of the two records can terminate. On the other hand however, consider a comparison of the age fields of two records. If age was recorded as the number of complete years lived, and the interval between the compilation of the records was not an integral number of years, then the two recorded ages, while both being accurate, are not unlikely to differ by one year[61]. Further of course, there are many other reasons why two fields may not be fully consistent: misreporting, misrecording, variation in spelling, non-contradictory description, change, and even errors introduced by the researcher when transcribing the data. This introduces the most important issue in record linkage in historical demography, that "by meta-Leibnizian principles, a pair of identifying items which on the surface seem to be contradictory are, at a deeper level, equivalent" (Winchester, 1972:7).

Some examples of surface differences are illustrated with the Berkeley/Barclay puzzle (Winchester, 1973a:32):

Surname	Initials	Birthdate	Birthplace	Occupation
Berkeley	G J	1676	Dublin	Sailor
Barclay	J G	1667	Ireland	Tailor

If these two records are linked, the puzzle becomes one of whom is identified? Berkeley or Barclay? And what is one entitled to say about him?

With textual data in particular, standardisation and coding of the data can be used to remove many surface differences, thus simplifying the comparison of fields; this essentially amounts to treating certain pairs of words and phrases as fully consistent. In historical demography, the majority of these surface differences arise because certain pairs of letters and digraphs either sound the same, or look the same. First, the non-standardisation of orthography in earlier periods caused variations in the spelling of many words; this is particularly problematic in the comparison of names. Since the written form was derived from the spoken form,

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[61]For example, an individual recorded as being 10 years old on 31 December, 1986 must have been born in 1976. However, if his age is recorded again on 31 June, 1987, it may be 10 or 11 years.

these variations are often easy to identify and have been approached using phonetic coding systems which attempt to reverse the name recording process, so that different written forms of the same spoken word are coded identically. To this end, many researchers have adopted the original Russell Soundex code, some modification thereof, or other similar systems (Newcombe et al, 1959; Newcombe & Kennedy, 1962; Newcombe, 1967; Nitzberg, 1968; Smith, 1968; Winchester, 1970; Légaré, 1972; Blayo, 1973; Pouyez et al, 1983)[62]. However, success with historical material has remained somewhat limited (Wrigley & Schofield, 1973:98). Second, there is the problem that certain pairs of letters are very similar in their script form, as for example the S/T in the occupation field of the Berkeley/Barclay puzzle. This problem has been approached using a Viewex code (Winchester, 1968). Ideally of course, a coding system incorporating a combination of Soundex and Viewex is desirable (Winchester, 1970).

Considering names, even once orthographic variations have been removed, several problems, often peculiar to the particular society under study, remain to be tackled. In Sweden, during the nineteenth century, it was common for people when adult to abandon their patronymic name and take a new surname (Sundin, 1985). In late medieval and early renaissance Italy, names were often shortened or lengthened (e.g. Vestro for Silvestro, or Marchetto for Marco) (Herlihy, 1973:49), and inversion of name order was not uncommon (Skolnick, 1970). In the linkage of census name data from the Saguanay region in Quebec, between 1850 and 1861, these sorts of problems cause Pouyez et al (1983) to find that men's names are consistent from one census list to the next only in 78% of the cases. This might be compared with record linkage at the Demographic Data Base at Umeå University, Sweden, where more than 90% of entries can

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[62]The Russell Soundex code, for example, is derived as follows:
1. The initial letter of the family name is used as such without numerical code and serves as a prefix letter.
2. Letters w and h are always disregarded except when serving as prefix letters.
3. Vowels a,e,i,o,u, and y are not coded; they serve as dividers (c.f. rule 5 below).
4. The following letters, not to exceed three in number, are coded as follows (subsequent letters are dropped): b,p,f,v=1; d,t=3; l=4; m,n=5; r=6; all other consonants (c,g,j,k,q,s,x,z) are coded 2.
5. Exceptions to the above rule are those letters after the prefix calling for the same code number; unless they are separated by a divider (c.f. rule 3 above), the second is dropped.
Source: Légaré (1972:438).

be linked using only parish of birth and date of birth information (Sundin, 1984). Perhaps the most sophisticated programs for handling names that have been developed so far are Winchester's. These involve prefix, infix, and postfix treatment of family names, combined with a Viewex/Soundex coding scheme. These transformations and the associated program are reviewed by the Pennsylvania Social History Project (Hershberg et al, 1976).

Considering fields other than name. Textual data suffer similar spelling variation, and, in addition, sometimes two different descriptions of a field need to be treated as fully consistent (e.g. place or occupation). For numerical data, Pouyez et al (1983) find that age discrepancies in truly linked record pairs ranged from zero to fifteen or more and were most frequently around 8-10 years, although discrepancies of fifteen or more years were by no means insignificant (6% of cases). Discussion of other fields and their treatment with respect to the problems of non-contradictory description and change can be found in Newcombe et al (1959), Newcombe & Kennedy (1962), Wrigley (1966), Nitzberg (1968), Tepping (1968), Winchester(1970), Katz & Tiller (1972), Hershberg et al (1976) and Pouyez et al (1983).

Having reviewed the standardisation and coding of data, attention is returned to the comparison of two records, one from each of two files. Considering the total number of possible links, where two files contain r_1 and r_2 records, it has hitherto been assumed that $r_1 \cdot r_2$ potential links are to be examined. However, this total can be dramatically reduced if each file is subdivided into blocks, according to the value of some highly reliable variable. For example, if each file is subdivided by sex, such that $r_1 = rm_1 + rf_1$ and $r_2 = rm_2 + rf_2$ (where rm and rf are the numbers of male and female records, respectively), then the total number of comparisons can be substantially reduced to $(rm_1 \cdot rm_2) + (rf_1 \cdot rf_2)$. Of course, the reduction in the total number of possible links increases rapidly with the number of values that the subdivision variable can take. Such methods of sorting and merging files, which optimise the search for reasonably comparable records, are discussed by Iverson (1962), Nathan (1964; 1967), and Newcombe (1967). It must be emphasised however, that the subdivision of two files into blocks is actually part of the record linkage process, in that it precludes linkage between blocks.

Indeed, in situations where the data are of fairly high quality and record linkage is relatively straightforward, similar non-probabilist methods, perhaps augmented by a simple set of tolerance rules, have been used for the entire record linkage process (Phillips et al, 1962; Hubbard & Fisher, 1968; Légaré, et al, 1972; Pouyez et al, 1983, Bouchard 1986).

In more complex situations, the comparison of two records leads to what Winchester (1974:36) describes as the "woolly regions of weighting systems". Leaving aside **ad hoc** procedures, three main approaches are reported in the literature. First, and perhaps most important, Felligi & Sunter (1967; 1969) and Sunter (1968) offer a formal mathematical description of Newcombe & Kennedy's (1962) work on record linkage; they propose a linkage strategy which seeks to minimise the number of records for which no linkage decision is made - under the assumption that the probabilities of erroneous matches and non-matches are fixed in advance. Second, Du Bois (1965; 1969) attempts to maximise the number of true links while simultaneously minimising the number of false links. Third, Nathan (1967) and Tepping (1968) attempt to minimise the expected cost of assigning links on the basis of a predefined comparison function (Winchester, 1974:52-55).

From a statistical point of view the most intuitive of these three methods is the first - a likelihood ratio approach. This is essentially as follows: Assuming that the fields of records are mutually independent[63], the likelihood ratio, or odds, of two records referring to the same historical person is calculated as the product of the likelihood ratio of each pair of fields. These ratios are a measure, then, of the probability that a particular field is consistent (or inconsistent) given that they are linked. In practise, the logarithm to the base 2 of each ratio is usually calculated, thus producing additive weights - binit weights (Newcombe & Kennedy, 1962)[64]. However, this approach requires that those

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[63]Intercorrelations between certain fields, such as age and marital status for example, do of course exist. However, where comparisons are based on the same fields, the resultant likelihoods will nevertheless comprise an ordinal scale, and can still be used meaningfully to prefer higher-scoring links (Wrigley & Schofield, 1973:93-94).

[64]A useful account of this procedure can be found in Wrigley & Schofield (1973:92).

ratios be known in advance, which in general they are not. They are usually calculated from a file of truly linked records as the number of truly linked pairs for which the combination of two fields arises, divided by the number of falsely linked pairs for which the combination arises. Unfortunately, this method of estimation of the probabilities can itself introduce bias and intercorrelations between fields (Wrigley & Schofield, 1973:93). Once all possible links have been examined, and their likelihoods calculated, the file of links can be sorted in decreasing order of likelihood, and the data linked from the most likely to the least likely pair above some predetermined likelihood. Even having adopted this approach, however, Hershberg et al (1976:161) remark that their file of linked persons is biased "toward individuals with characteristics which are uncommon, particularly toward those individuals with uncommon names".

To complete the review of record linkage, situations where there is duplication of identifying item sets, or there are more than two files of records must be discussed. The important difference between these and the previous situation is that the total number of possible solutions increases rapidly with the number of duplications, or additional files of records[65], leading to "the even woollier thickets of investigating networks of quasi-linked records" (Winchester, 1974:36). The processes involved here lean towards statistical cluster analysis, where some measure of the similarity between any pair of records is defined as before, and, according to this measure the records are gathered into groups or networks within which at least one of the links between each record and any other record of the same group is associated with a measure that exceeds some predetermined level. This procedure is then followed by one of examining each cluster in order to subdivide it into a number of historical persons while simultaneously maximising some measure of the likelihood that these subdivisions are indeed the correct ones. Methods for resolving such clusters are discussed by Skolnick (1973), Wrigley and Schofield (1973), and Bouchard (1986).

In conclusion, record linkage studies can be classified according to whether or not variation or errors or both exist in

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[65]The combinatorial problem of record linkage is formally illustrated by Kelley et al (1972), and Skolnick (1973).

identifying items of information, and whether or not there is duplication of identifying item sets (Winchester, 1973b; 1974; 1985). In the case where neither problem exists, record linkage becomes a trivial exercise; for example, this arises in the linkage of elites (e.g. Drake, 1971). Otherwise, some measure of the consistency of pairs of fields and then pairs of records is required, and a strategy for comparing clusters of possible links may also be required.

At the same time, although several general approaches and methodologies for efficient record linkage exist, each new study will present its own peculiarities, and will require its own particular set of priorities in identifying two separate records as pertaining to the same historical person. The type of data recorded, the frequency of recording, and the way in which data were recorded will influence the researcher's choice of algorithm to resolve ambiguities in record linkage, while maximising the accuracy of the constructed links. Nevertheless, whatever approach is adopted ought to be fully automatic; ensuring both that linkage criteria are carefully defined beforehand, and that those criteria are consistently applied.

Also, it can be seen from the above discussion that in order to enable records to be linked both within and between documents for subsequent analysis, several operations - the software requirements of record linkage - must be possible. First, and foremost, the data must be easily accessible for editing and, later, analysis. Second, it must be possible to transform or code the data in order to eliminate the simpler types of variation, such as spelling. Third, the comparison of one or more variables from each record should be a simple process, in order to allow concentration on the more complicated aspects of record linkage. Finally, it must be possible to store the links produced so that the linked data can be efficiently retrieved for subsequent analysis. One way to satisfy these requirements is to store the data in a powerful database. In Section 4.4.2, reasons for using the Scientific Information Retrieval (SIR) Data Base Management System (DBMS) for the storage, linkage, and retrieval of the Viana data are discussed.

4.4.2 The Data Base Management System SIR[66]

SIR is a hierarchical database system in its physical form; each record is stored following the record to which it relates. Thus, the set of information relating to each individual-entry on a document is given a unique identifier - a CASE in SIR - which points to several RECORDS concerning that entry, each of which, in turn, may contain several FIELDS (or VARIABLES)[67]. Because of the uncertainty inherent in historical demographic data, it would make little sense to use one of the fields of information of an individual-entry as the case identifier. Instead, a number for the individual-entry (NID) can be generated which may incorporate digits representing the document from which the individual-entry is drawn, the date it was created, its position within the document, etc. A major advantage of SIR is that, although it has a hierarchical physical model, one is not restricted to hierarchical access; the logical model of the database allows hierarchical, relational and network access. It is the network facility that is most useful for record linkage, since from any position in the hierarchical physical model it is possible to re-enter the hierarchy at any other whilst retaining the original position for subsequent continued search.

The SIR system has been shown to be extremely useful in the development of a general approach to the machine handling of event history data (Ní Bhrolcháin & Timaeus, 1983). It is a natural extension then, for it to be used in the handling of record linkage material which comprises events that are to be linked into person, or individual life histories.

The biggest problem in the computer-handling of manuscript sources is that the bulk of them contain textual variables. It soon becomes apparent that, with each name, occupation, birthplace, etc., appearing many times on various documents, the space saved by coding

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[66] Software and techniques concerning the application of the data base management system SIR in historical demography which are described in this Section were developed with Dave Doulton - a description can be found in Doulton & Kitts (Forthcoming).

[67] Some slight confusion is unavoidable here because the term record has a different meaning in SIR than it has in the record linkage literature. The CASE in SIR often represents the record discussed earlier; the disparity arises because of the intermediate level of RECORD in SIR, into which closely related FIELDS (or VARIABLES) are grouped.

each variable would be enormous. Lookup tables can be created as records in SIR by constructing dummy cases containing the coding tables for any number of textual variables, so that only numbers are recorded in the fields of each case. Also, similar coding tables can be used to store standardised versions of textual variables, and associated indicator variables which might be required for record linkage or subsequent analysis. Further, this coding and standardisation of data, which is essentially a simple extension of the way in which marital status is often recorded (i.e. Single=1, Married=2, Widowed=3, etc.), simultaneously enables the frequencies of occurrence of each variable to be stored for use in record linkage programs, and allows the data to be processed more efficiently because numerical values for fields are available.

In order to illustrate these facilities, the storage of names in the Viana Database is described. When a name is read into the database from a raw data file, it is split up into its component names: a title (if any); a first name; and other, second names. For each component name, existing codes are used, or new codes are created; these codes are stored in the relevant fields of a name record belonging to that case. At the same time, frequencies of occurrence are recorded, and the codes are indexed so that each component name points to all the cases which contain it in their name record. Next, a reverse lookup table record is created so that the original component name can be retrieved from the recorded code. This lookup table also contains a standardisation variable into which the code of a standardised version of the component name is entered. The standardisation variable can be generated automatically, or entered manually. If it is entered manually, standardisation is initially quite laborious, but offers the enormous advantage of handling any type of data coding and standardisation. An essentially similar, but slightly simpler, procedure is used to store textual information on occupation, and birthplace, where the raw data are not split up into individual words.

Finally, an additional advantage of the system described here is that while data are stored in their original form, and can be retrieved as such, standardised data can be used for micro-analyses, thereby offering researchers the option of being spared confusion arising from variations in spelling, etc.

4.4.3 Record Linkage using SIR

In SIR, the number uniquely identifying each case, or individual-entry - the NID - can be used to generate links which are stored in a subordinate record for each case. This record contains the NID of the the first individual-entry (FID), the NID of the previous individual-entry (PID), and the NID of the next individual-entry (LID) of each identified historical person. The LID of the last individual-entry is set to equal the FID, so that a chain is formed for each person, the end of which points back to its beginning. Subsequent identification of relationships between different historical persons can then be achieved by linking two or more chains together. For example, a family link record may be created to contain those links required for family reconstitution; one of the variables in this record might contain the FID of the father of a person.

The FID serves several purposes. First, it enables a chain to be followed from its beginning even if it was entered at some other point. Second, it is possible to determine when the end of a chain has been reached. Third, when processing all the cases in the database sequentially, and following the chain of individual-entries for each historical person at the same time, it enables SIR to determine whether the information on one person has already been processed. Finally, the FID is the identifier used for linking different chains, as described in the previous paragraph.

Thus, the versatility of SIR allows attention to be focused on the major problem of record linkage exercises - the determination of a set of linkage criteria, or control variable which will maximise the accuracy of the links generated. The choice of control variable will depend primarily on whether the researcher chooses an agglomerative or a divisive approach to record linkage, or a combination of the two.

An agglomerative approach involves a reduction of the number of variables contributing to the control variable, thus relaxing the constraints under which a link is made; in this way, groups of records belonging to persons can be brought together. This method is particularly applicable when there is a limit to the number of records which can belong to one person; it is therefore being used in the linkage of birth, marriage, and death records. It is possible to

control the generation of links, so that previous links which were generated using stronger constraints, are not overwritten.

A divisive approach involves an increase of the number of variables contributing to the control variable, thus tightening the constraints under which a link is made. Usually, this approach will begin with just one variable, the standardised full name, so that all the records which might belong to one or more persons can be brought together. The resultant links can then be examined, and any records which are inconsistent under a specified set of criteria, can be removed and placed into other chains. This method is particularly applicable when there may be many records belonging to a person, but few persons share the same initial variable.

The operations of joining and separating different chains are fairly complex procedures. In order to join two chains which are non-overlapping, the end of the first can simply be made to point to the beginning of the second. Otherwise however, one of the chains has to be completely dismantled, and its individual members inserted into the other chain. Similarly, to divide a chain into two non-overlapping sub-chains is quite straightforward, whereas to extract selected members from one chain to form a new chain is more complicated.

4.5 Preparation of the Viana Data for Record Linkage

This Section illustrates and discusses the technical problems arising in the use of both the textual and numerical data recorded on the manuscript sources of Viana, and the methods and techniques which have been adopted to overcome them.

4.5.1 Data Entry and Storage

In order to retain the data in their original form without altering the structure of the original manuscript sources, and to allow any item of information to be traced back to its source document, each set of information relating to one individual on a particular document (individual-entry) is given a unique identifier, the number of the individual-entry (NID) comprising eight digits: the first coded according to the nature of the document[68], the next three to the year in which it was drawn up, the fifth to the parish to which it related[69], and the last three to the position of the information within the document[70]. This coding is such that if data are sorted by NID, they are automatically sorted first within a document, then by parish, next in time, and finally by type of document. For example, to retrieve the standardised full name of the first individual recorded on the 1840 electoral register of Santa Maria Maior, the case 2-840-1-001 is located, and then the name record it points to. From this record the name code variable is extracted, and used to retrieve the individually standardised component names from the name lookup table record; these are then concatenated to form the standardised full name.

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[68]Document code: 1 - Muster-Roll, 2 - Electoral Register, 3 - Passport Book, 4 - Cemetery List.

[69]Parish code: 0 - Viana (Town/City), 1 - Santa Maria Maior, 2 - Monserrate. Only the electoral registers were drawn up separately for each parish; the code for Viana (0) is used for the other documents.

[70]For the muster-rolls, the NID is modified to comprise the document type, and address of the individual, including the road, house, and position of the information within that house.

Initial experiments used a BASIC input program which could be modified for each type of document. Run on the BBC microcomputer, the program asked for the NID of the first individual-entry, and then asked for every possible item of information relating to consecutive individual-entries. However, it was found to be far more efficient for the data on documents in columnar format to be entered one variable at a time. Two methods were therefore adopted for the input of textual data. More experienced researchers entered data directly into ASCII data files using a variety of word processing packages on the BBC, IBM-PC-AT and IBM-PS/2 microcomputers. Those with less experience entered data into mini SIR databases on IBM PC-ATs which built up validation tables so that when a component name not already known to SIR was entered the researcher could seek confirmation before continuing. On the other hand, numerical data were always entered directly into ASCII data files. Only information on marital status was coded when the data were originally entered.

Currently, there are approximately 7,000 muster-roll, 39,000 electoral register, 2,000 passport book, and 12,000 cemetery list individual-entries stored on the University of Southampton mainframe computer - an IBM 3090-150.

4.5.2 Problems of the Manuscript Sources

Considering textual data, first, the orthography of Portuguese had not yet been standardised in the nineteenth century, certain characters were sometimes interchangeable[71], and others, usually silent, were often omitted entirely[72]. Second, the documents were often written in extremely abbreviated form, such that words would sometimes be truncated to the first letter followed by a full stop. Third, where the document had a fixed columnar format, scribes would often reduce their work by using the word **idem**, or just quotation

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[71] For example, the B and V (and W in the nineteenth century) are sometimes interchangeable; this peculiarity of pronunciation is still common in the Minho. Similarly, the letter x is pronounced the same as the digraph ch, with which it was therefore sometimes interchangeable.

[72] For example, the C, M, and P, are sometimes silent, as in Victorino/Vitorino, Sam Miguel/São Miguel, and **esculptor/escultor**, respectively.

marks[73], to indicate that an item of information was the same as that for the previous entry. Finally, the obvious difficulties of reading early nineteenth century Portuguese script must not be under-estimated; it is extremely difficult to differentiate between certain combinations of hastily scrawled letters, even with a thorough knowledge of the language[74].

Names, the most powerful of the variables available for record linkage, not only present the difficulties of textual data outlined above, but also several of their own. First, Portuguese names have been abbreviated for centuries according to unwritten convention (some of the oldest abbreviations can still be found in common use). Unfortunately however, although some researchers have suggested that every abbreviation can be found in the lists of any modern Portuguese telephone directory (e.g. Rowland, 1987), relatively few of those encountered in nineteenth century manuscripts actually appear, and where they do, the abbreviations sometimes generate further ambiguity[75]. Under these conditions, record linkage must be a recursive process, alternating between exploratory linkage and the subsequent "decoding" of hitherto unknown abbreviations. Second, the formation of Portuguese names does not follow the relatively predictable pattern of northern European countries. They are essentially composed of one or more first names followed by one or more second names[76], any of which might be passed on to the next generation[77]. The flexibility thereby introduced not only exacerbates linkage between generations, but also the linkage between different entries of a person since it was not uncommon for someone to change his name, either by dropping a component name, merging two

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[73]In fact, it appears that quotation marks were used on the early electoral registers to indicate that a particular item of information was not available, and were only used in the same sense as **idem** after 1840.

[74]Examples include B/R, F/T, L/P/S, T/V, Al/M, a/o, g/q/z, l/t, n/u/v, in/ni/m, m/rr, etc.

[75]For example, Martins was abbreviated to Miz, it is now abbreviated to Mart.

[76]The term second name is used to avoid confusion with surname - a hereditory family name transmitted in male line.

[77]See Feijó (1987) for an exploratory analysis of name formation using the muster-rolls of the parish of Carreço - just north of Viana.

component names[78], adding a component name, or even just altering the order of two or more component names. Also, since first and second names are often passed on in twos or threes, it cannot be assumed that the probabilities of component names occurring in a full name are statistically independent[79]. A further result of the name formation process is that it was not uncommon for an individual to have a total of four or more component names. Practical considerations then led to the omission of one or more component names from manuscript documents - notably, the electoral registers[80]. Today, in order to overcome some of these problems, Portuguese nationals are often asked to "state all names in the order in which they appear on the identity card or passport"[81]; in the nineteenth century, however, this was unfortunately not so. As an illustration of some the problems, several of the full names of individual-entries referring to Manuel Felix Mancio da Costa Barros (the mayor of Viana between 1855 and 1859) are shown below:

Manoel Felix Mancio da C.^{ta}

M.^{el} Felix Mancio da Costa Barros

Manoel Felix M.^{cio} da Costa Barros

Manoel Felix Mancio da C.^{ta} Bar.^{os}

Occupation data suffer all the aforementioned problems of textual data without the compensatory advantage of fairly consistent

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[78] For example, while it is simple to separate Villas-Boas into the two names Villas and Boas, the occasional merging of a d' with a name beginning with a vowel (e.g. d'Antas/Dantas) is impossible to detect at the data entry stage. Neither is it possible in the latter case simply to combine all the occurrences of d' with the following word, since it is sometimes completely absent.

[79] For example, assuming that full names were consistently recorded in full on the cemetery lists, and taking all 5,418 males with at least two names for whom all component names are known, proportions with António or José occurring as one of the first two component names are calculated (with * denoting any name) as: P(António,*)=0.15, P(*,António)=0.06, P(José,*)=0.19, P(*,José)=0.12, P(António,José)=0.02, P(José,António)=0.02. Thus, while P(António,José)=0.024, P(António,*)•P(*,José)=0.017.

[80] For example, the second name José was sometimes omitted; more often however, the last of two or more second names was omitted.

[81] For example, European Communities Social Security Regulations - Certificate of Entitlement to Benefits in Kind During a Stay in a Member State [E111] [GB], Note 1a.

or obvious abbreviations[82]. In fact, particularly on the electoral registers, it appears that the scribes may have recorded occupations in extremely abbreviated form because they were familiar with many of the electors and would therefore know the full occupation of an individual upon identifying who he was[83]. This creates the feedback effect that while occupation might be used for record linkage, sometimes linkage is required in order to identify occupation accurately. Finally, in some cases the occupational description is perfectly legible but initially quite unfamiliar. Where these occupational descriptions are not later found in dictionaries or encyclopaedias[84], they must be treated as unknown.

Birthplace information, although usually recorded without abbreviations, and sometimes supplemented by **termo de ...** (in the neighbourhood of ... [a larger town]), is often still quite ambiguous[85]. This variable also suffered from the use of **idem**. Finally, although it appears frequently on all but the electoral registers, its usefulness for record linkage is further limited because the majority of the population was born in Viana itself.

Marital status is subject to two quite different forms of uncertainty. First, only a handful of people (usually females with children) were explicitly recorded as being single on the muster-rolls and in the passport books. However, the importance of marital status in indicating the availability of an individual for military service would suggest that the majority of those for whom no record was made are likely to have been single. Second, on the electoral registers and cemetery lists, the recording of this variable suffered very heavily from the use of **idem**.

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[82] For example, the occupation **Am.se da R. da F.** was recorded on several electoral registers before it appeared in full as **Amanuense da Repartição da Fazenda**.

[83] For example, the occupation **P. do Lyceu** was used for both **Porteiro** and **Professor do Lyceu**.

[84] For example, the occupation **lampianista** was eventually found in the **Grande Enciclopédia Portuguesa e Brasileira** in Porto's municipal library; a **lampianista** was a public gas lamp cleaner.

[85] For example, the birthplace given as Braga could have been referring to the City, the Borough, or the District of Braga. In addition, sometimes the patron saint of the parish of birth was given, rather than the the parish itself, so that the birthplace São Miguel could have been referring to any of four parishes in the Borough of Viana, the 15 in the rest of the district, or even one further afield.

Numerical data generate much less ambiguity of course, only being affected by illegibility and inaccuracy[86]. Dates of birth were sometimes only recorded to the month, or even the year, and were initially the cause of a certain amount of confusion on the muster-rolls, where they sometimes appear as a combination of characters and digits[87]. However, where available and accurate, date of birth provides an invaluable variable for record linkage. Of the sources considered here, it only appears on the muster-rolls, where it facilitates the identification of intra-urban migrants enormously.

Age, although fairly consistently recorded, was very inaccurate; on the early electoral registers, a discrepancy between the ages recorded for one individual in adjacent years of up to 10 or 12 years is not unusual. By the 1870's, however, the rolls were being updated from the previous year, reducing the problem with respect to the linkage of sequential registers enormously, though not necessarily providing greater absolute accuracy.

4.5.3 Coding and Standardisation of the Data

Marital status information, as mentioned in Section 4.5.1, was coded when the data were originally entered. The coding is designed in such a way as to be able to distinguish, for example, between individuals explicitly recorded as married and those whose recorded marital status, **idem**, referred back to some previous individual explicitly recorded as married[88].

Textual data were retrieved and listed alphabetically so that variations in abbreviation and spelling generally appeared close together, enabling lookup tables to be created manually. Each textual variable was then given a standardisation code which points to its standardised version; sometimes, where no standardised version

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[86] Inaccuracy in numerical data is caused by transcription, transposition, and other errors; of these, Smythe (1968) finds that the most difficult to correct - transcription errors - are by far the most common (accounting for 80% of the errors in his data set).

[87] For example, the month written as **9.**^{**bro**} referred to November, not September.

[88] Marital Status code: 0 - Unknown, 1 - Single, 2 - Married, 3 - Widowed, 4 - Clergy, 5 - Divorced, 6 - Single **idem**, 7 - Married **idem**, 8 - Widowed **idem**, 9 - Clergy **idem**.

already existed, one would be created. In addition, besides being standardised, text was coded for the purposes of record linkage and subsequent analysis.

Two occupational groupings were adopted. First, the twelve occupation function groups used for the Portuguese census of 1890 were incorporated[89]. Unfortunately, no records of which occupations belonged to which group exist, but almost identical groupings for the 1834 census of the Iberian port of Gibraltar were referred to (Howes, 1950:142-157). In addition, a thirteenth occupation category - Ambiguous - was included. Imprecise occupational descriptions which could be members of more than one group, such as "captain" which could be a captain in the armed forces or a ship's captain in the professions group, were placed in this category. Second, contemporary grouping by economic sector was also used[90]. In both cases the code is slightly modified to include a code for those with no recorded occupation[91].

A code for places was devised that could be used for both birthplace and destination (on the passports). It comprises 11 digits: the first refers to the continent, the second to country, the next two to province, then two for district, two for borough, two for settlement (city, town, or village), and finally, one for parish. The code therefore corresponds with administrative rather than geographical boundaries. Two main types of ambiguity arose: First, where several places with the same name existed, the place was coded as being the nearest one of that name. Second, as is the case with Viana, a place name was often common to a district, borough, and

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[89] Occupation function code: 0 - Unknown, 1 - Agriculture, 2 - Hunting & Fishing, 3 - Mining, 4 - Trades & Industry, 5 - Transport, 6 - Commerce, 7 - Armed Forces, 8 - Public Administration, 9 - Professions, 10 - **Proprietários**, 11 - Domestic Service, 12 - Unproductive/Unclassified, 13 - Ambiguous. The category **Proprietário** is somewhat problematic; it was introduced during the second quarter of the nineteenth century, and literally meant someone whose livelihood was derived from the rent collected on property which he owned. However, the status it implicitly carried ensured its growth in popularity beyond its original meaning. Thus, although the 1890 census enumerators were trained to ask probing questions in order to classify members of the population correctly (Recenseamento da População, 1890:XX-XXI), those drawing up other documents were less careful, thus generating pseudo **Proprietários** on these other documents. Other manuscript sources from Viana suggest that some of these pseudo **Proprietários** were engaged in agriculture.

[90] Occupation sector code: 0 - Unknown, 1 - Primary, 2 - Secondary, 3 - Tertiary, 4 - Unproductive, 5 - Unclassified.

[91] See Armstrong (1972) for a discussion of the coding of occupational information.

city. In coding the data therefore, the place "Viana" was assumed to mean the Town/City; except where otherwise indicated, the names of other boroughs in the District of Viana were coded as the borough rather than its principal town; and outside the District of Viana, district names were coded as the district rather than their principal boroughs or cities. In this way, as much ambiguity as possible is avoided, and inaccuracy is minimised.

Finally, with respect to names, as mentioned in Section 4.4.2, each name is split up into it component names: a title (if any); a first name; and other, second names; these three types of component names are then standardised separately. There are two important reasons for this. First, abbreviated component names can be standardised according to their position within the full name[92]. Second, while first names are important in the identification of the sex of individual-entries, the exact form of second names is less important. Also, certain component names, which are sometimes difficult to differentiate between, are simply standardised together. In order to illustrate these points, a number of standardisations are shown in Table 4.8.

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[92] For example, Lour.⁰ is standardised to Lourenço if it appears as the first component name, Loureiro otherwise.

Table 4.8   Example Component Name Standardisations

Type	Raw Component Name	Expansion of Abbreviation	Standardisation
0	P.e	Padre	
1	Albano		Alb-no
1	Albino		Alb-no
1	Alvano		Alb-no
1	Alvino		Alb-no
1	Ellario		Ilario
1	Hylario		Ilario
1	Ilario		Ilario
1	Lour.o	Lourenço	Lourenco
2	Lour.o	Loureiro	Loureiro
2	Agonia		Agonia
2	(da) Gonia		Agonia
2	Sa		Sa/Silva
2	S.a	Silva	Sa/Silva
2	Cerq.a	Serqueira	Serqueir-
2	Cerqueiras		Serqueir-
2	Cerqueiro		Serqueir-
2	Segueira		Serqueir-
2	Serqueira		Serqueir-
2	Feixeira		Teixeira
2	Teixeira		Teixeira

In conclusion, the standardisation process allows for the individual standardisation of variables to the extent required for record linkage. Although this might initially appear to be a somewhat **ad hoc** procedure, it is potentially more powerful than automatic techniques in common use (e.g. Soundex or Viewex). In short, any and all the coding and standardisation problems outlined in this Section can be overcome using this system.

4.6 Record Linkage of the Viana Data

This Section describes the record linkage of the Viana data in detail. First, record linkage within the muster-rolls is presented. This precedes the more detailed discussion because, to a great extent, the muster-rolls explicitly provide their own links. Indeed, the record linkage of the muster-rolls enabled many of the problems of record linkage of the Viana data to be assessed. Second, a truly linked example event history is presented; this provides an illustration of the typical migration patterns among the urban elite which are a focal point of this research, and introduces the discriminatory power of the standardised and coded data. Next, the discriminatory power of the variables available for record linkage is discussed more generally. Finally, the linkage variables, criteria, and procedures adopted for the automatic record linkage within and between the different sources comprising the Viana data are described in detail.

4.6.1 Linkage Within the Muster-Rolls

To a great extent, the muster-rolls explicitly provide links between the different entries of persons who appear more than once. Therefore, the record linkage of the muster-rolls enables many of the problems of record linkage of the Viana data (e.g. the recording of Portuguese names) to be assessed.

Explicit links between entries are available because, where persons moved from one household to another, their movements are usually recorded on the rolls as observations such as **Passou para Rua Nova de Santa Anna N.$^{\text{o}}$ 7**[93]. Further, the muster-rolls include a large number of persons - mostly adult females and young males - who share the same full name (because few component names were recorded), and for whom little other information is recorded. Under these circumstances, the record linkage within the muster-rolls was

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[93]On the one hand, observations sometimes only refer to another road of Viana, without specifying any particular household: on the other hand, in cases where movement was to another household on the same road, only the number of the household is recorded.

initially performed using only explicitly recorded links. Later, this linkage was scrutinised and supplemented using other fields with significant discriminatory power.

Of the 6,858 muster-roll entries, 501 have an intra-urban movement recorded as an observation, and a name field[94]. The record linkage of these entries using their explicitly recorded links was performed in two stages; each stage was automatic[95] except that where a muster-roll entry was to be inserted in an existing chain of entries, or a choice of links existed, the program presented the fields of each record and requested the NIDs of the new chain; of course, this too could have been automated, but the number of cases involved did not justify the amount of programming that would have been required. First, links were created where one and only one individual with a consistent full name appeared in the household or road referred to; this resulted in 357 linkages (17 interactive) - no match could be found for 144. Second, possible links where the first standardised component name matched, and one set of component names was a subset of the other were examined interactively. This resulted in a further 66 linkages (28 interactive); 13 possible linkages were rejected because of inconsistencies in other fields; and, no possible matches could be found at all for the remaining 65.

The possible existence of other links within the muster-rolls - caused by the failure of the authorities to record all intra-urban movements - is most easily investigated using the date of birth field. With a population of certainly less than 10,000 during the period 1826-1833, the likelihood of two male residents of Viana sharing the same date of birth and the same first component name is

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[94] A further 17 entries - infants - have a recorded intra-urban movement but no available name; these can be linked using the links of other members of the same household.

[95] The program processes the entire database, identifying cases for which an observation record begins with the character string **"Passou para rua"**; the immediately following road and household number are then used to search the household referred to (this is possible because the muster-roll NIDs are initially generated from the road and household number). Upon completion of this search, the program resumes processing the entire database.

low[96]; it is therefore reasonable to create links between entries for which these fields are consistent. This approach created 133 new linkages, of which 31 were added to previously existing chains[97]. Further interactive exploration using looser date of birth and name matches provided another 51 linkages.

In conclusion, it can be seen that while the explicit links recorded on the muster-rolls generated 436 linkages, a further 184 could be added using date of birth and name matches. There is little doubt that some links have been missed using these strategies, and that some of the 620 linkages are spurious, but these errors are minimised; certainly there is no evidence to suggest otherwise.

The muster-roll links described in this Section are used for the analysis of population and migration presented in Chapter 5, but they have subsequently been overwritten by links generated using the fully automatic procedures described in Sections 4.6.4 and 4.6.5.

4.6.2 An Example Event History

A truly linked example event history is presented in Table 4.9. This serves two purposes. First, it provides an illustration of the typical migration patterns among the urban elite which are a focal point of this research. Second, it introduces the discriminatory power of the standardised and coded data.

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[96]This point is illustrated by considering a hypothetical, closed, stable population in which every person lives for exactly 35 years - about 12,783 days. With a population of around 4,000 persons, the probability of a person being born on a particular day is 0.31 (4,000/12,783); the probability of two persons being born on that day is 0.10 (0.31²). Then, with, say, 35% of the population sharing the most common first component name, the probability of two persons being born on one day and being given the same first component name is 0.03 (0.35•0.31²).

[97]In fact, 138 possible linkages were generated, but 5 were rejected because of inconsistencies in other fields.

Table 4.9   The Event History of João da Silva São Miguel

Muster-Rolls:

Date of Birth   21/12/1808
Birthplace   São Miguel de Carreira   (Braga District)
Occupation   Cloth Merchant
Address   1, Rua do Caes; 1, Rua do Villarinho

Electoral Registers: 1834, 1835, ... , 1878

Birthplace   São Miguel de Aves   (Porto District)
                      São Miguel   (Viana District)
                      Matriz **idem**   (Viana District)
                      São Miguel de Setelada   (Unknown)
Age discrepancy   From 42 Electoral Rolls:
                      Minimum 0, Maximum 9, Mode 2,
                      Mean -0.07, Standard deviation 3.23
Marital Status   Single -1836, Married 1840-
Occupation   Merchant

Cemetery Lists:

Date of Death   29/07/1878
Birthplace   São Miguel de Junteira   (Unknown)
Marital Status   Married
Address   Rua do Caes

Occurrences of His Sons:

João da Silva São Miguel Junior was issued with a passport for Brazil in 1859 (aged 21). He does not appear on any other documents, so it is unlikely that he ultimately returned to Viana.

Manuel da Silva São Miguel appears on the electoral registers between 1880 (aged 41, single, merchant) and 1911. He married between 1883 and 1888, but his wife died between 1891 and 1894. He appears on the cemetery lists in 1919.

António da Silva São Miguel was issued with a passport for Rio de Janeiro in 1856 (aged 14). He returned before 1880, when he began to appear on the electoral registers (single, merchant); he appears on the cemetery lists in 1910.

José da Silva São Miguel was issued with a passport for Brazil in 1861 (aged 18, occupation **caixeiro**). He does not appear on any other documents, so it is unlikely that he ultimately returned to Viana.

João da Silva São Miguel probably moved to the Town of Viana in about 1828, because he first appears on the muster-rolls in the second ink and handwriting of the First Company. Soon thereafter, he moved from his first place of residence - a household in which a family of merchants lived - to an apartment of his own, less than 100 metres away. Later, he married in 1836, and remained based in Viana until he died in 1878; he appears on every electoral register between 1834 and 1878, and on the cemetery list of the latter year. He and his wife had at least four children, of which three were sent to Brazil, thereby avoiding military conscription. His wife died in 1906.

The linkage of records referring to João da Silva São Miguel is particularly straightforward because his name suffered little variation; it was always recorded in full, including all his component names. Also, apart from one of his sons, nobody else with the same full name appears to have existed in Viana during the period of study[98]. Further, his wife and children are also easily identified, since no other family appears to have had full names terminating with the components São Miguel. Thus, with respect to names, the Silva São Miguels are certainly not typical. At the same time, however, the record linkage of the São Miguels is almost certainly correct, so that variations in other items of information concerning João da Silva São Miguel can be used to provide an introductory illustration of the discriminatory power of these fields.

First, age discrepancies can be investigated under the assumption that João da Silva São Miguel's date of birth was accurately recorded (twice) on the muster-rolls. As can be seen, there was sometimes a difference of up to 9 years between his actual and recorded age. Second, it is known from the marriage records of Santa Maria Maior that João da Silva São Miguel (birthplace São Miguel de Carreira, Borough of Barcellos, District of Braga) married Rosa Maria d'Amorim (birthplace Santa Maria Maior) on 10 February, 1836; therefore, his recorded marital status is always accurate. Third, occupational information on João da Silva São Miguel is also

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[98]The slight complication that arises because one of João da Silva São Miguel's sons is also called João da Silva São Miguel is easily resolved using age information.

always accurately recorded, and always consistently coded - as commerce in the occupation function code, and tertiary in the occupation sector code. Finally, considering birthplace, it is likely that João da Silva São Miguel personally provided his birthplace for his muster-roll entries and marriage record, while the authorities drawing up the electoral registers did not consult him directly, and those drawing up the cemetery lists simply could not. This may explain why the five birthplaces given on the latter two documents differ from each other, and from the three birthplaces recorded elsewhere. As can be seen, his first recorded birthplace on the electoral registers is erroneous; his second (simply São Miguel) is wrongly coded as the nearest parish with that patron saint; his third ([Matriz] idem) is also erroneous; and his fourth, together with that recorded on the cemetery list, are unidentified.

4.6.3 Discriminatory Power of Record Linkage Variables

In this Section, the discriminatory power of the variables available for record linkage is discussed more generally. In order to explore the issues raised, the records of males appearing on the cemetery lists in the period 1875-1899 are examined closely. Attention is restricted to these 1,844 records[99] for two reasons: First, young children, who only appear on the earlier cemetery lists, and whose first component name alone was usually recorded, are excluded. Second, the extent of inter-generational repetition of full names is reduced. Of course, the advantage of this analysis is that individuals rarely appear more than once on the cemetery lists[100], so that potential links are known to be false.

Names are without doubt the most powerful variable consistently available for record linkage. However, while the standardisation and coding of component names overcome the problems of variation in the recording of component names, they fail to resolve those of component

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[99] The sample excludes a few individuals for whom one more component names are not known; for example, that of a body washed up on Viana's beach.

[100] A small number of individuals do appear on the cemetery lists more than once, but the fact that their corpses were dug up and then reburied is usually recorded.

name omission or reordering. These problems can be approached using search algorithms which explore the database for occurrences of component name subsets, generating files of potential links. In essence then, the standardised full name variable can be used to bring together all possible links. The resulting chains can then be divided using other information.

To explore these issues, the frequencies with which the standardised full names of the example records appear more than once are shown for different numbers of component names in Table 4.10. (It is to be noted that this analysis is performed under the assumption that names were consistently recorded in full, which may not have been the case).

Table 4.10 Full Name Repetition on the Cemetery Lists

| Frequencies | Number of Component Names | | | | | |
	1	2	(%)	3	(%)	≥4
1	3	317	81	911	94	280
2	0	46	12	47	5	3
3	0	14	4	5	1	0
≥4	0	13	3	2	0	0
Total (Different Names)	3	390	100	965	100	283
Total (Occurrences)	3	527		1028		286

The figures indicate that by linking on standardised full name only, less than 20% of links are false. Further, by considering the sub-population with full names consisting of three or more component names only, this figure reduces to about 5%. Where linkage of the urban elite is concerned, the figure, though difficult to quantify, ought to be even smaller.

Also, the 1,248 different standardised full names consisting of three or more component names were examined in order to find how many of them occur with an identical first component name as subsets of one or more of the 283 names consisting of four or more component names; 84 do, in a total of 104 longer names. Of these matches, 73 involved the inclusion or addition of one more component name; in 13 cases between the first and second components, in 17 cases between the second and third components, in 40 cases at the end of a three-component name, and in the other 3 cases at the end of a four-component name. All the remaining 11 matches involved the inclusion or addition of two more component names.

Next, age information is considered. Age is the most powerful variable for differentiation between different persons with identical standardised full names. For example, age information is available for 42 of the 104 false matches identified above; the age discrepancies associated with these 42 pairs of records[101] have the following statistics: minimum 2, maximum 76, mean 26.1, and standard deviation 19.7. With respect to variations in the recorded ages of individuals, the truly linked example of the previous Section provides a useful illustration. Statistics of the 42 available age discrepancies are: minimum 0, maximum 9, mode 2[102], mean -0.1, and standard deviation 3.2. Further, the number of individual ages recorded as being greater than 90 on the electoral registers suggests that age discrepancy increases with actual age[103]. Nevertheless, the evaluation of the discrepancy between two ages is not straightforward. Having calculated an approximate year of birth from available date of birth or age information, two approaches might be adopted. First, a fixed cutoff point for the discrepancy is considered. Where fathers and sons share identical standardised full names, a difference of 15 years would usually provide the correct division of records; however, where persons not directly related share identical standardised full names, a 15 year cutoff point for age differences would sometimes fail to provide adequate division[104]. Second, the discrepancy might be scored; this approach is adopted in the linkage of the Viana data, and is described in Section 4.6.4.

Finally, marital status, occupation and birthplace information are considered. On the one hand, marital status and occupation information are rarely as accurately recorded as for the truly linked example of the previous Section. On the other hand, birthplace information rarely presents the complete lack of accuracy evident in

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[101] These age discrepancies are: 2, 2, 3, 5, 5, 5, 6, 7, 8, 10, 11, 12, 13, 14, 14, 15, 16, 20, 20, 20, 21, 21, 22, 23, 26, 27, 28, 29, 32, 38, 40, 41, 41, 41, 42, 44, 47, 51, 57, 67, 75, and 76.

[102] The modal age discrepancy of 2 years arises because, in the example given, age was for some years updated from the previous year's electoral register

[103] Some researchers, however (e.g. Nitzberg, 1968), find no evidence of any correlation between age and magnitude of age discrepancy.

[104] For example, 16 of the 42 age discrepancies reported above were less than or equal to 15.

the truly linked example of the previous Section; nevertheless, it is scarcely informative for record linkage since it is only recorded on a handful of electoral registers, and because a large proportion of the population was born in the Viana itself.

In conclusion, the Viana data can certainly not be described as being of high quality. However, considering the two main problems of record linkage (variation and errors in identifying items, and duplication of identifying item sets), the techniques described in previous sections allow the former problem to be reduced considerably; and, because the urban elite are of primary interest, the latter problem is relatively small.

4.6.4 Linkage Variables and Criteria

In this Section, the linkage variables and criteria discussed generally in the previous Section are described explicitly. First, the variables extracted from each record are described, then the match scoring functions developed to measure the consistency of pairs of these variables are described. Finally, the application of these variable match scoring functions using a record match scoring function is described.

The most important variable is the NID; from this variable, three linkage variables are extracted: document (DOC), parish (PAR), and year of entry on document (YOE). The next most important variable is the standardised full name (SFN); this is extracted as a series of standardised component name codes (SCNCs) together with their respective frequencies of occurrence in the data base (CNFs); and the number of component names (NOCN) is separately recorded. Other variables extracted are: birthplace code (BPC); estimated year of birth (EYB), available directly from date of birth or indirectly from age; marital status code (MSC); occupation function code (OFC), and occupation sector code (OSC).

The match scoring functions developed to measure the consistency of these variables essentially return one of several values; they return a value of unity when insufficient information is available, a value greater than unity when the matching criteria are met, and a value less than unity when they are not. The match scoring functions are: name (FNAM), document (FDOC), year of entry (FYOE), parish

(FPOE), birthplace (FBPC), birth and residence interaction (FBOR), year of birth (FEYB), age at entry (FAAE), marital status (FMSC), occupation (FOCC), duplicate electoral (FDEL), and record (FREC).

The name match function compares the standardised full names of two records. The two standardised full names are considered to be consistent if they share the same first component name, and all the component names of the shorter name occur in the longer name. If the two standardised full names are inconsistent, the name match score (FNAM) is set to 0; otherwise, it is set according to a comparison of the numbers of component names: if both standardised full names have more than four components, it is set to 2; if both have more than five, it is set to 3; if both have more than six, it is set to 4; and, if both have seven, it is set to 5.

The document match function checks two criteria: that individuals only appear once on the electoral registers of any year, and that individuals do not reappear after having been buried. If these criteria are met, the document match score (FDOC) is set to 1, otherwise it is set to 0.

The year of entry match function is incorporated in order that records with no age, marital status, occupation, or birthplace information can be linked to records with close years of entry. If the absolute value of the difference between the years of entry (AYE) is less than 15, the year of entry match score (FYOE) is set to just greater than 1: FYOE=1+(15-AYE)•(0.0006). Further, an explicit allowance is made for records from the electoral registers drawn up in the years 1837-1839 (in which only names were recorded). If one of the records is from an electoral register drawn up in the years 1837-1839, and the other record is from an electoral register drawn up for the same parish in the years 1834-1842, the year of entry match score is set to just greater than two: FYOE=2+(7-AYE)•(0.1).

The parish match function requires that both records refer to residents of the same parish, or that such information is unavailable. If these criteria are met, the parish match score (FPOE) is set to 1, otherwise it is set to 1/8.

The birthplace match function checks that two places of birth are consistent. For example, if the parishes of birth are available for both records, then they must be identical; but where, say, only one parish and one borough of birth are available, the parish must merely be in that borough. If these criteria are met for a

birthplace outside the Town/City of Viana, the birthplace match score (FBPC) is set to 6; if they are met for a specified parish of Viana, it is set to 3; if they are met for Viana with parish unspecified, it is set to 2; if information is unavailable it is set to 1; and if the criteria are not met, it is set to 1/2.

An additional birth or residence interaction match function is included so that where place of birth and parish of residence match scores are unavailable but the place of birth of one record is the place of residence of the other (i.e. one of the two parishes of the Town/City of Viana), the birth or residence match score (FBOR) is set to 2; otherwise it is set to 1.

The year of birth match function compares year of birth information. If one or both the estimated years of birth are unavailable, the year of birth match score (FEYB) is set to 1. Otherwise, the year of birth match score is set according to the absolute value of the discrepancy between the estimated years of birth. Further, because the recording of age was sometimes quite inaccurate on the electoral registers, the score allocated to the discrepancy depends on the combination of documents from which the records originate. Where records from the muster-rolls, passport books, or cemetery lists are concerned, the year of birth match scores are set as follows: for discrepancies from 0 to 4 years, the scores are: 6.5, 6.4, 6.3, 6.2, and 6.1; for discrepancies from 5 to 14 years, the scores are: 1.10, 1.09, 1.08, 1.07, 1.06, 1.05, 1.04, 1.03, 1.02, and 1.01; for discrepancies from 15 to 24 years, the scores are: 1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256, and 1/512; and for discrepancies of more than 24 years, the score is set to 0. Where both records are from the electoral registers, the year of birth match scores are set as follows: for discrepancies from 0 to 4 years, the scores are: 6.5, 6.4, 6.3, 6.2, and 6.1; for discrepancies from 5 to 14 years, the scores are: 4.6, 4.5, 4.5, 4.3, 4.4, 4.5, 4.4, 4.3, 4.2, and 4.1; for discrepancies from 15 to 24 years, the scores are: 4.6, 4.5, 4.5, 4.3, 4.4, 4.5, 4.4, 4.3, 4.2, and 4.1; and for discrepancies of more than 24 years, the score is set to 1/24.

An additional age at entry interaction match function is included to ensure that the age at entry implied by the linkage of year of birth and year of entry information from two records is reasonable. If the year of entry for one record precedes the year of

birth implied by the other, then the age at entry match score (FAAE) is set to 0. If the linkage of a record from the electoral registers would imply that the age of the elector was less than 15, then the age at entry match score is set to 0. And, if the linkage of a record from the cemetery lists would imply an age at death of less than 0 or greater than 124, then the age at entry match score is set to 0. Otherwise, it is set to 1.

The marital status match function can be applied at two levels. The first, a strong marital status match, requires that the implied marital statuses are identical. The second, a weak marital status match, merely requires that an individual cannot have been explicitly recorded as single after they had been explicitly recorded as married, or widowed. Where a muster-roll record is involved, a strong marital status match is required, otherwise only a weak marital status match is required. These differences are incorporated because the muster-rolls were compiled during a relatively short period in which the variation of information may be assumed to be minimal, but the other documents were compiled over long periods in which recording is likely to suffer increased variation, and marital status will also have changed naturally. For a consistent marital status match (weak or strong, as appropriate), the marital status match score (FMSC) is set to 1, and for a poor match, it is set to 1/2. Also, irrespective of the documents from which the records originate, if the marital status of one record indicates that he is a member of the clergy, while the other record's marital status is specified as single, married, or widowed, then the marital status match score is set to 1/4.

The occupation match function requires that occupation function codes and occupation sector codes are identical; if they are, the occupation match score (FOCC) is set to 6. Otherwise, if the occupation function codes are identical, but the occupation sector codes are not, or the occupation function codes are not identical, but the occupation sector codes are, then the occupation match score is set to 1/2. Finally, if the occupation function codes are not identical, and the occupation sector codes are very different (i.e. a primary sector and a tertiary sector), then the occupation match score is set to 1/8.

Finally, an additional duplicate electoral match function is included. If both records are from electoral registers drawn up in

the same year, then the duplicate electoral match score (FDEL) is set to 1/4; otherwise it is set to 1. This allows for two possibilities. First, certain electors are known to have sometimes appeared on the registers of both parishes drawn up in a particular year. Second, sometimes two (sometimes even three) electors with identical names and virtually indistinguishable other characteristics appear on the electoral register of one parish. This problem is discussed further in Section 4.6.7, which covers the performance, and limitations, of the record linkage.

The record match function evaluates each of the above match scores, and calculates the record match score (FREC) as their product (FREC=FNAM·FDOC·FYOE·FPOE·FBPC·FBOR·FEYB·FAAE·FMSC·FOCC·FDEL). The record match function was tuned by adjusting the match scoring functions to emulate a human decision process. This was accomplished using a number of linkage examples from the Viana Database, including several of the most difficult. Also, all possible combinations of variable match scores were generated and analysed, to ensure that the record match scoring function was in some sense robust.

The tuning of the record match scoring function is best illustrated with a few examples. First, record match scores must be intuitively meaningful with respect to the variable match scores from which they are generated; for example, the combination of a good age match score and a poor occupation match score (due to occupational mobility, perhaps) must generate a higher record match score than that generated by a poor age match combined with a good occupation match. Second, peculiarities of the data being linked must be accommodated; for example, the existence of records with only age information, and the likelihood that certain electors sometimes appeared on the electoral registers of both parishes in a particular year. Third, important interactions between linkage variables must be examined; for example, the implied age at death resulting from the linkage of a record from the cemetery lists to a record with age information on another document.

In general, a record match score less than or equal to unity is considered as a poor record match, while a record match score greater than unity is considered as a good record match. The match scoring functions are summarised in Table 4.11.

Table 4.11 Match Scoring Functions

Function	Poor match	Unavailable	Good match
FNAM	0	-	1 to 6
FDOC	0	-	1
FYOE	1	-	1.0006 to 1.009
FPOE	1/8	1	1
FBPC	1/2	1	2, 3 or 6
FBOR	1	1	F2
FMSC	1/4 or 1/2	1	1
FOCC	1/8 or 1/2	1	6
FEYB	0 to 1	1	1 to 6.5
FAAE	0	1	1
FDEL	1/4	1	1

The power of the record match function can be illustrated by completing the discussion of the micro-analysis presented in the previous Section. The 104 pairs of records identified in Section 4.6.3, for which the shorter full name occurs with an identical first component name as subsets of the longer name, were linked using all but one of the variable match scoring functions described - the document match scoring function was suppressed. 20 of the 104 pairs were linked, but it is important to emphasise that not one would have been linked if the document match scoring function had been included in the record match scoring function. These 20 pairs were scrutinised in order to ascertain the cause of the failure of the algorithm to identify their potential links as false. An example illustrates the problem clearly: António Joaquim Pereira was buried in 1889, he was born in Monserrate, and died aged 54, married, with no recorded occupation; António Joaquim Pereira Braga was buried in 1895, he was also born in Monserrate, he died aged 55, married, and was recorded as being a shoemaker. Unfortunately, in the record linkage of the Viana data, using the methodology and techniques adopted, it would be impossible not to link a pair of records with such similar characteristics, without failing to link other pairs of records which do pertain to the same historical person.

4.6.5 Linkage Strategy

The approach adopted essentially comprises five stages, incorporating a combination of agglomerative and divisive procedures. In Stage 1, all records with identical standardised full names are linked together into chains. In Stage 2, a search algorithm identifies pairs of chains for which standardised full names indicate a possible match - a possible match is defined as occurring when two standardised full names share the same first component name, and all other component names of the shorter name occur in the longer name. These chains are linked together to form larger chains. In Stage 3, the chains of records are divided into blocks of records; blocks of records are defined as having the same number of component names, and identical sets of component names, with the same first component name, but other component names not necessarily always in the same order. In Stage 4, the blocks of records are further divided into sub-blocks using supplementary information; these sub-blocks represent different historical persons with identical sets of standardised component names. Finally, in Stage 5, each chain of blocks and sub-blocks is dealt with separately. First, links between sub-blocks of different blocks are generated, starting with the most likely name matches. Then, again drawing upon supplementary information, a set consisting of the records of one historical person is extracted.

Thus, Stages 1 & 2 are agglomerative; they ensure that all possible matches are linked together within chains. Stages 3 & 4 are divisive; they break down the chains into blocks and sub-blocks, according to the name variable alone, and then using supplementary information. Finally, Stage 5 is again agglomerative, in that sub-blocks of different blocks are collected, enabling a set consisting of the records of one historical person to be extracted. In the remainder of this Section, the five stages comprising the record linkage strategy are described in more detail.

In Stage 1, all records with identical standardised full names are linked together into chains. Stage 1 linkage statistics are shown in Tables 4.12 and 4.13, for males and females respectively. Considering males, it can be seen that while the mean number of records per set is greater than four for names with four or less component names, it is about two for names with five or more

component names. This reflects two phenomena: first, the likelihood of two individuals sharing a full standardised name decreases as the number of component names increases; second, individuals with many component names were often recorded using only a subset of those names.

Following Stage 1, only records belonging to males with full names consisting of three or more components are considered. This is in order that attention is focused on records for which the name variable has substantial discriminatory power. In the context of this research, this does not present a problem, because the (male) urban elite are of primary interest. However, it is noted that it is perfectly possible for a name with two components to be rarer than another name with three or more components; so the exclusion of names with two or less components represents a somewhat simplistic approach.

In Stage 2, a search algorithm identifies pairs of chains for which standardised full names indicate a possible match - a possible match is defined as occurring when two standardised full names share the same first component name, and all other component names of the shorter name occur in the longer name. These chains are linked together to form larger chains. According to these criteria, any Stage 1 chain may be linked to many other Stage 1 chains, so the resultant Stage 2 chains often comprise a number (sometimes a very large number) of Stage 1 chains. The effect of ignoring component name order for all but first component names is illustrated in Table 4.14. A comparison of Tables 4.12 and 4.14 indicates that for names of three to six components, the number of sets has decreased. For example, considering names with six components, it can be seen that two names occurring just once each are identical except for the order of their third to sixth component names; thus, in Table 4.14, the number of sets of just one record has fallen by two, while the number of sets of exactly two records has risen by one.

Following Stage 2, only chains of more than one record are considered; this is because chains of only one record represent sets consisting of the records of only one historical person.

In Stage 3, the chains of records are divided into blocks of records; these blocks of records are defined as having identical sets of standardised component names, but not necessarily always in the

same order. The blocks correspond to the sets of records shown in Table 4.14.

In Stage 4, the blocks of records with identical sets of standardised component names are divided into sub-blocks using supplementary information; these sub-blocks represent different historical persons with identical sets of standardised component names. Sub-blocking is performed as follows. First, the records of a block are sorted by NID. Thus, the records from each document type are processed separately; muster-roll records are considered first, then electoral register records, then passport book records, and finally cemetery list records; and, within the latter three document types, the records are sorted in time. Then, each document type is processed separately; and within each document type, each year of entry is processed separately. Each record being processed is compared with each existing sub-block of the block, and, if appropriate, linked to it. If none of the comparisons with existing sub-blocks are satisfactory, then a new sub-block is created to contain the record. For each comparison, the record is compared with every record in a particular sub-block, and the geometric mean of all the record match scores is calculated. If this average record match score exceeds unity, the sub-block is linked to the sub-block. Where several average record match scores exceed unity, the record is inserted in the sub-block with the highest average record match score.

In certain circumstances, the sub-blocking process therefore becomes slightly complicated; for example, where more than one electoral register record exists for the same year of entry within a single block (i.e. two or more electors in a particular year had matching names). Consider the sub-blocking of the block with standardised full name Manuel José Rodrigues. By the time the sub-blocking process has reached the year of entry 1854 on the electoral registers, two sub-blocks have been created. In 1854, four electors were recorded with the standardised full name Manuel José Rodrigues; two in the parish of Santa Maria Maior, and two in Monserrate. The sub-blocking process calculates average record match scores for the comparison of each of these four electoral register records with each of the two existing sub-blocks; thus, eight comparisons are made. The comparison record and sub-block with the highest average record match score are then linked, and the

sub-blocking process recalculates the comparisons of the three remaining records with the sub-block in which the first record has been inserted. This iterative process continues until all the five electoral register records have been allocated to sub-blocks.

Linkage statistics summarising the effects of Stages 2, 3 & 4 are shown in Table 4.15. It can be seen that the 39,079 records comprise a total of 8,725 blocks; these blocks have been allocated to 6,531 chains, and have been divided into 11,103 sub-blocks. Thus, at the end of Stage 4, a minimum of 6,531, and a maximum of 11,103 historical persons have been identified.

Following Stage 4, only chains of more than one sub-block are considered; this is because chains of only one sub-block represent sets consisting of the records of only one historical person.

Finally, in Stage 5, each chain of blocks and sub-blocks is dealt with separately. First, links between sub-blocks of different blocks are generated, starting with the most likely name matches. Then, again drawing upon supplementary information, a set consisting of the records of one historical person can be extracted. Two distinct procedures are performed on each chain.

In Stage 5A, the block of records whose standardised full name comprises the largest number of component names - the master block - is selected from the chain. Then, any other blocks whose standardised full names comprise a subset of these master component names are selected from the chain. All the records selected are stored in a sub-chain. Next, the standardised component names of the master block are notionally reordered by frequency of occurrence, and their codes are stored in a variable. Then, the standardised component names of all the other blocks in the sub-chain are similarly reordered. Finally, the blocks of the sub-chain are sorted by this notionally-reordered-standardised-component-name-code variable. This procedure results in an ordering of blocks by some measure of the likelihood that members of the block match members of the master block[105].

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[105] For example, a block with several relatively rare component names in common with the master block and one relatively common component name missing, is more likely to contain records which pertain to the same historical person as those of the master block than a block with several relatively common component names in common with the master block and one relatively rare component name missing.

In Stage 5B, each sub-block of each block in the sub-chain is compared with the master block, and, if appropriate, linked to it. For each comparison, every record in the sub-block is compared with every record in the master block, and the geometric mean of all the record match scores is calculated; thus, if there are r_m records in the master-block, and r_s records in the sub-block, the average score will be the geometric mean of $r_m \cdot r_s$ record match scores. If this average record match score exceeds unity, the sub-block is linked to the master-block. Having then extracted all the records of one historical person, and returned any remaining records of the sub-chain to the main chain, the linkage program returns to Stage 5A.

Final linkage statistics are shown in Table 4.16. It can be seen that from the 39,079 records, 9,723 historical persons have been identified; this figure lies between the minimum (6,531) and maximum (11,103) number of historical persons identified at the end of Stage 4. Of these, 9,057 individual chains comprise records with identical standardised full names; however, a total of 666 individual chains (7% of all individual chains) have only been created because the linkage strategy specifically allows for component name omission and reversal. Indeed, one particular individual chain comprises eight different blocks. Gonçalo Joaquin Almeida Sousa Sá Baptista appears on the muster-rolls once, on 26 electoral registers, and on the cemetery lists once. There is virtually no doubt that all these 28 records pertain to a single historical person, since there is a high degree of agreement among the variables; his year of birth is always between 1780 and 1785, he was always an employed in the customhouse, and, presumably, he got married between 1836 and 1842. Examples of the eight different combinations of his component names are:

NID	Standardised Full Name
1-17-003-01	Gonçalo Joaquin Almeida Sousa Sá Baptista
2-854-2-058	Gonçalo Joaquin Almeida Sousa Baptista
2-835-2-029	Gonçalo Joaquin Almeida Sá Baptista
2-834-2-030	Gonçalo Joaquin Almeida Baptista
2-852-2-049	Gonçalo Joaquin Almeida Sá
2-845-2-059	Gonçalo Joaquin Almeida
2-844-2-041	Gonçalo Almeida Sá Baptista
2-836-2-132	Gonçalo Almeida Baptista

Table 4.12   Stage 1 Record Linkage Statistics (Males)

Component Names	1	2	3	4	5	6	7
Records in Set							
1	53	1131	3466	1369	209	33	5
2	16	263	743	269	31	6	1
3	17	139	340	102	16	4	1
4	6	89	217	80	7	3	-
5	8	57	188	57	3	-	-
6-10	9	189	512	169	26	1	1
11-50	10	176	698	231	15	3	-
51-1000	7	22	23	-	-	-	-
Sets	126	2066	6187	2277	307	50	8
Records	1519	9597	28945	9167	891	136	16

Total Sets 11021, Records 50271.

Table 4.13   Stage 1 Record Linkage Statistics (Females)

Component Names	1	2	3	4	5	6	7
Records in Set							
1	51	1080	2240	779	140	25	2
2	15	211	172	12	4	-	-
3	7	76	48	-	-	-	-
4	5	42	17	-	-	-	-
5	2	29	3	-	-	-	-
6-10	8	45	1	-	-	-	-
11-50	11	45	2	-	-	-	-
51-1000	2	11	-	-	-	-	-
Sets	101	1539	2483	791	144	25	2
Records	706	4050	2841	803	148	25	2

Total Sets 5086, Records 8575.

Table 4.14   The Effect of Ignoring Component Name Order, for all but First Component Names (Males)

Component Names	1	2	3	4	5	6	7
Records in Set							
1	53	1131	3395	1352	206	31	5
2	16	263	741	270	32	7	1
3	17	139	342	100	16	4	1
4	6	89	219	80	7	3	-
5	8	57	188	57	3	-	-
6-10	9	189	510	170	26	1	1
11-50	10	176	698	231	15	3	-
51-1000	7	22	23	-	-	-	-
Sets	126	2066	6116	2260	305	49	8
Records	1519	9597	28945	9167	891	136	16

Total Sets (≡Blocks) 10960, Records 50271.

Table 4.15   Stages 2, 3 & 4:   Record Linkage Statistics

Component Names	One-Block Chains					Chains Consisting of More Than One Block											
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.
3	.	.	1	.	.	1	.	1	1	1	1	.	1	1	.	.	.
4	.	.	.	1	.	1	.	1	1	1	1	1	.	.	1	1	1
5	.	.	.	.	1	.	1	1	1	.	1	.	1	1	1	1	1
6	.	.	.	.	.	1	.	1	.	1	.	1	.	.	1	1	.
7	.	.	.	.	1	.	1	.	1	1	.	1	1	.	.	.	1
Blocks in Chain																	
1	4814	985	121	19	2	—	—	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	333	21	—	1	—	—	—	—	—	—	22	1
3	—	—	—	—	—	101	2	2	—	7	2	1	—	—	—	1	—
4	—	—	—	—	—	35	—	—	—	8	—	—	1	—	—	—	—
5	—	—	—	—	—	6	—	—	—	9	—	—	—	2	—	—	—
6-10	—	—	—	—	—	14	—	—	—	7	1	—	—	3	—	—	—
11-50	—	—	—	—	—	2	—	—	—	2	—	—	—	—	—	—	—
51-500	—	—	—	—	—	—	—	—	—	3	—	—	—	—	2	—	—
501-1000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chains	4814	985	121	19	2	491	23	2	1	36	3	1	1	5	2	23	1
Blocks	4814	985	121	19	2	1276	48	6	2	646	12	4	3	35	700	47	2
Sub-Blocks	5612	1005	124	19	2	1749	63	7	2	1081	13	5	4	47	1312	53	2
Records	17991	2489	199	28	2	7864	287	8	4	4406	54	7	5	129	5296	291	2

Total Chains 6531, Blocks 8725, Sub-Blocks 11103, Records 39079.

Note: There is a slight discrepancy between Tables 4.14 and 4.15. On the one hand, there are a total of 10,960 Blocks, and 50,271 Records; or, considering records with three or more component names only, 8,768 Blocks, and 39,155 Records. On the other hand, in Table 4.15, there are a total of 8,725 Blocks, and 39,079 Records. The differences arise because the statistics for the two tables were calculated at stages of database development between which the raw data were edited, and a number of records with erroneous names were deleted.

Table 4.16 Final Record Linkage Statistics

Component	One-Block Chains	Chains Consisting of More Than One Block
Names		
1	· · · · · ·	· · · · · · · · · ·
2	· · · · · · ·	· · · · · · · · · ·
3	· 1 · 1 · · ·	· 1 1 1 1 1 1 1 1 ·
4	· · 1 · · · ·	· 1 1 · 1 1 1 1 · ·
5	· · · 1 · · ·	1 · 1 · 1 · 1 1 1 1
6	· · · · · · ·	· · · · · 1 · 1 · 1
7	· · · · · 1 ·	1 · 1 1 1 · 1 · · 1
		· · · · · · · · · ·
Blocks in Chain		
1	7099 1728 198 34 7	– – – – – – – – – –
2	– – – – –	467 35 4 12 1 1 1 – 37 2
3	– – – – –	67 4 2 6 1 – 1 – 6 –
4	– – – – –	11 2 – 6 – – 1 1 – –
5	– – – – –	1 – – 1 – – – 1 – –
6-10	– – – – 1	– – – 1 1 1 1 1 – –
Chains	7099 1728 198 34 7	546 41 6 19 1 1 1 1 2 43 2 3
Blocks	7099 1728 198 34 7	1184 90 14 65 3 3 4 9 13 92 4 6
Records	25489 5690 402 65 10	6025 367 79 331 14 23 9 66 476 4 29

Total Chains 9731, Blocks 10544, Records 39079.

4.6.6 Illustrative Example Linkages

In order to clarify the preceding sections on linkage variables, criteria, and particularly procedure, two illustrative example linkages are drawn from the Viana data. The first example is taken from Stage 5A, where a standardised full name consisting of six standardised component names (António Pereira Cirne Sa/Silva Besera Fagundes) has been selected from a chain as the first standardised full name with the largest number of component names. The chain from which this block has been selected is one of four long chains comprising many combinations of standardised component names beginning with the common first component names António, João, José, and Manuel; these chains contain 345, 135, 356, and 253 blocks; 999, 274, 807, and 725 sub-blocks; and 2781, 920, 2516, and 2120 records, respectively.

In Table 4.17, the ordering of blocks by some measure of the likelihood that members of the block match members of the master block is shown. In Table 4.18, the division of blocks into sub-blocks is illustrated. Finally, in Table 4.19a, the extracted records of one historical person are shown; and in Table 4.19b, the records returned to the main chain are shown.

An important point that must be made is that, having extracted the records of one historical person, the remaining records of the sub-chain must be returned to the main chain; the linkage procedure must not continue to work on the remaining records of the sub-chain. The reason for this is best illustrated with a simple example. The remaining records in the sub-chain all have the standardised full name António Pereira Sa/Silva; this is a subset of António Joaquin-Pereira Sa/Silva, which is the standardised full name of a block still in the main chain.

An examination of the records presented in Tables 4.19a and 4.19b suggests that the record linkage is very satisfactory. In particular, it can be seen that if the first record of block 6 sub-block 1 (NID 2-844-2-163) had been individually compared with the master block, it would have been linked to it. The record was not linked to the master block because a more likely link exists between it and the other record of block 6 sub-block 1 (NID 2-845-2-214); that link being more likely because the standardised full names are identical (also there is a parish match and a place of birth match).

Table 4.17 Illustrative Example Linkage 1:
Stage 3: Ordering of Blocks (B)

NID	B	Standardised Full Name
2-856-1-048	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-861-1-054	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-862-1-064	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-863-1-073	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-864-1-071	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-865-1-068	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-866-1-061	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-867-1-065	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-868-1-067	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-869-1-064	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-870-1-064	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-871-1-062	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-872-1-066	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-874-1-062	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-875-1-060	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-876-1-062	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-877-1-071	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-878-1-071	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-880-1-101	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-881-1-097	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-883-1-118	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-888-1-112	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-891-1-125	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-894-1-078	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-895-1-068	1	António Pereira Cirne Sa/Silva Besera Fagundes
4-900-0-136	1	António Pereira Cirne Sa/Silva Besera Fagundes
2-873-1-065	2	António Cirne Sa/Silva Besera Fagundes
2-845-1-035	3	António Pereira Sa/Silva Besera Fagundes
2-847-1-027	4	António Pereira Besera Fagundes
2-846-1-025	5	António Pereira Cirne
2-852-1-038	5	António Pereira Cirne
2-853-1-046	5	António Pereira Cirne
2-854-1-051	5	António Pereira Cirne
2-855-1-048	5	António Pereira Cirne
2-857-1-041	5	António Pereira Cirne
2-858-1-052	5	António Pereira Cirne
2-859-1-045	5	António Pereira Cirne
2-860-1-053	5	António Pereira Cirne
2-844-2-163	6	António Pereira Sa/Silva
2-845-2-214	6	António Pereira Sa/Silva
2-855-2-026	6	António Pereira Sa/Silva
3-867-0-010	6	António Pereira Sa/Silva
2-911-2-169	6	António Pereira Sa/Silva
4-919-0-101	6	António Pereira Sa/Silva

Table 4.18 Illustrative Example Linkage 1:
Stage 4: Division of Blocks (B) into Sub-Blocks (SB)

NID	B	SB	BPC	EYB	MSC	OFC	OSC	NAME ACRONYM
			Linkage Variables					
2-856-1-048	3	1	–	1822	2	10	3	A.P.C.S.B.F.
2-861-1-054	3	1	–	1815	2	10	3	A.P.C.S.B.F.
2-862-1-064	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-863-1-073	3	1	–	1827	7	–	–	A.P.C.S.B.F.
2-864-1-071	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-865-1-068	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-866-1-061	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-867-1-065	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-868-1-067	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-869-1-064	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-870-1-064	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-871-1-062	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-872-1-066	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-874-1-062	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-875-1-060	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-876-1-062	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-877-1-071	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-878-1-071	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-880-1-101	3	1	–	1828	7	10	3	A.P.C.S.B.F.
2-881-1-097	3	1	–	1828	7	10	3	A.P.C.S.B.F.
2-883-1-118	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-888-1-112	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-891-1-125	3	1	–	1827	7	10	3	A.P.C.S.B.F.
2-894-1-078	3	1	–	1828	7	10	3	A.P.C.S.B.F.
2-895-1-068	3	1	–	1828	7	10	3	A.P.C.S.B.F.
4-900-0-136	3	1	11010101011	1819	2	10	3	A.P.C.S.B.F.
2-873-1-065	2	1	–	1827	7	10	3	A. C.S.B.F.
2-845-1-035	3	1	–	1819	6	10	3	A.P. S.B.F.
2-847-1-027	4	1	–	1821	1	10	3	A.P. B.F.
2-846-1-025	5	1	–	1820	1	10	3	A.P.C.
2-852-1-038	5	1	11010101011	1818	7	10	3	A.P.C.
2-853-1-046	5	1	–	1822	7	10	3	A.P.C.
2-854-1-051	5	1	–	1821	2	10	3	A.P.C.
2-855-1-048	5	1	–	1821	2	10	3	A.P.C.
2-857-1-041	5	1	–	1823	2	10	3	A.P.C.
2-858-1-052	5	1	–	1824	–	10	3	A.P.C.
2-859-1-045	5	1	–	1824	2	10	3	A.P.C.
2-860-1-053	5	1	–	1825	2	10	3	A.P.C.
2-844-2-163	6	1	11000401000	1819	–	6	3	A.P. S.
2-845-2-214	6	1	11000401000	1820	–	7	3	A.P. S.
2-855-2-026	6	2	–	1800	7	6	3	A.P. S.
3-867-0-010	6	3	11010101010	1854	–	–	3	A.P. S.
2-911-2-169	6	4	–	1883	3	4	2	A.P. S.
4-919-0-101	6	4	11010102000	1874	2	4	2	A.P. S.

Table 4.19a Illustrative Example Linkage 1:
Stage 5: Extracted Historical Person

NID	B	SB	Linkage Variables BPC	EYB	MSC	OFC	OSC	NAME ACRONYM
2-845-1-035	3	1	-	1819	6	10	3	A.P. S.B.F.
2-846-1-025	5	1	-	1820	1	10	3	A.P.C.
2-847-1-027	4	1	-	1821	1	10	3	A.P. B.F.
2-852-1-038	5	1	11010101011	1818	7	10	3	A.P.C.
2-853-1-046	5	1	-	1822	7	10	3	A.P.C.
2-854-1-051	5	1	-	1821	2	10	3	A.P.C.
2-855-1-048	5	1	-	1821	2	10	3	A.P.C.
2-856-1-048	1	1	-	1822	2	10	3	A.P.C.S.B.F.
2-857-1-041	5	1	-	1823	2	10	3	A.P.C.
2-858-1-052	5	1	-	1824	-	10	3	A.P.C.
2-859-1-045	5	1	-	1824	2	10	3	A.P.C.
2-860-1-053	5	1	-	1825	2	10	3	A.P.C.
2-861-1-054	1	1	-	1815	2	10	3	A.P.C.S.B.F.
2-862-1-064	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-863-1-073	1	1	-	1827	7	-	-	A.P.C.S.B.F.
2-864-1-071	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-865-1-068	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-866-1-061	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-867-1-065	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-868-1-067	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-869-1-064	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-870-1-064	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-871-1-062	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-872-1-066	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-873-1-065	2	1	-	1827	7	10	3	A. C.S.B.F.
2-874-1-062	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-875-1-060	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-876-1-062	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-877-1-071	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-878-1-071	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-880-1-101	1	1	-	1828	7	10	3	A.P.C.S.B.F.
2-881-1-097	1	1	-	1828	7	10	3	A.P.C.S.B.F.
2-883-1-118	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-888-1-112	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-891-1-125	1	1	-	1827	7	10	3	A.P.C.S.B.F.
2-894-1-078	1	1	-	1828	7	10	3	A.P.C.S.B.F.
2-895-1-068	1	1	-	1828	7	10	3	A.P.C.S.B.F.
4-900-0-136	1	1	11010101011	1819	2	10	3	A.P.C.S.B.F.

Table 4.19b Illustrative Example Linkage 1:
Stage 5: Records Returned to Main Chain

NID	B	SB	Linkage Variables BPC	EYB	MSC	OFC	OSC	NAME ACRONYM
2-844-2-163	6	1	11000401000	1819	-	6	3	A.P. S.
2-845-2-214	6	1	11000401000	1820	-	7	3	A.P. S.
2-855-2-026	6	2	-	1800	7	6	3	A.P. S.
3-867-0-010	6	3	11010101010	1854	-	-	-	A.P. S.
2-911-2-169	6	4	-	1883	3	4	2	A.P. S.
4-919-0-101	6	4	11010102000	1874	2	4	2	A.P. S.

The second illustrative example linkage is chosen to demonstrate the limitations of the record linkage procedure adopted. This example concerns the sub-blocking of just one block - the block with standardised full name Manuel José Rodrigues. This block was alluded to earlier in the description of Stage 4 of the linkage strategy. The linkage procedure divides the 99 records of this block among eight sub-blocks.

In Table 4.20, the resultant sub-blocks are presented; Table 4.20a contains the records of the first sub-block, and Table 4.20b contains the other sub-blocks. On the one hand, an examination of the records presented in Table 4.20a suggests that the linkage of the first sub-block is not very satisfactory. In particular, it can be seen that in many years in the 1850s three electors are included in the sub-block; so at least three different historical persons are contained in the first sub-block. On the other hand, an examination of the records presented in Table 4.20b suggests that the linkage for the remaining sub-blocks is quite satisfactory. The second sub-block contains the records of a priest; the third contains the records of a wood-carver; and, the fourth contains the records of a shoemaker. Finally, The last four sub-blocks each contain just one single cemetery list record; it is likely that one or two of these may belong to records which have been allocated to the first sub-block.

The problem occurs because the linkage procedure is unable to distinguish adequately between the records which are allocated to the first sub-block. Considering the information available from the electoral registers of 1851, the characteristics of the three individuals are as follows:

Parish	EYB	MSC	OFC	OSC	Actual Occupation	
Santa Maria Maior	1805	7	6	3	**Vendeiro**	(Trader)
Monserrate	1804	3	4	3	**Pintor**	(Painter)
Monserrate	1807	7	4	2	**Sapateiro**	(Shoemaker)

As can be seen, two of the three electors live in the same parish, all three have estimated years of birth within three years of each other, two are married, two are engaged in trades, and two are engaged in the tertiary occupation sector. Of course, it would be possible to adjust the linkage procedure so that these records would be separated. But, there are many instances where linkage variables exhibit legitimate change; so, if the linkage procedure were adjusted, other sub-blocks would be incorrectly partitioned.

Table 4.20a Illustrative Example Linkage 2:
Stage 4: Division of Blocks (B) into Sub-Blocks (SB)

			Linkage Variables					
CHAIN	B	SB	NID	BPC	EYB	MSC	OFC	OSC
10100925	152	1	1-810-0-804	-	1805	2	4	2
10100925	152	1	2-837-2-105	-	-	-	-	-
10100925	152	1	2-839-2-101	-	-	-	7	3
10100925	152	1	2-844-1-290	11010103010	1804	2	4	3
10100925	152	1	2-845-1-364	-	1807	2	4	3
10100925	152	1	2-848-1-250	-	1806	3	4	3
10100925	152	1	2-849-1-284	-	1814	2	4	2
10100925	152	1	2-849-1-324	-	1807	3	4	3
10100925	152	1	2-851-1-378	-	1805	7	6	3
10100925	152	1	2-851-2-162	-	1804	3	4	3
10100925	152	1	2-851-2-184	-	1807	7	4	2
10100925	152	1	2-852-2-111	11010103010	1807	3	4	3
10100925	152	1	2-853-1-332	-	1806	7	6	3
10100925	152	1	2-853-2-135	-	1813	3	4	3
10100925	152	1	2-853-2-158	-	1809	7	4	2
10100925	152	1	2-854-1-309	-	1805	7	6	3
10100925	152	1	2-854-2-144	-	1806	3	5	3
10100925	152	1	2-854-2-145	-	1808	2	4	2
10100925	152	1	2-855-1-299	-	1805	7	6	3
10100925	152	1	2-855-2-140	-	1806	3	4	3
10100925	152	1	2-855-2-141	-	1808	2	4	2
10100925	152	1	2-856-1-296	-	1806	7	6	3
10100925	152	1	2-856-2-138	-	1807	3	4	3
10100925	152	1	2-857-1-273	-	1807	7	6	3
10100925	152	1	2-857-2-132	-	1808	3	4	3
10100925	152	1	2-858-1-312	-	1808	2	6	3
10100925	152	1	2-858-2-140	-	1809	3	4	3
10100925	152	1	2-859-1-291	-	1808	7	6	3
10100925	152	1	2-859-2-141	-	1810	1	4	3
10100925	152	1	2-860-1-326	-	1808	2	6	3
10100925	152	1	2-861-1-322	-	1799	2	6	3
10100925	152	1	2-862-1-345	-	1799	2	6	3
10100925	152	1	2-863-1-439	-	1799	2	6	3
10100925	152	1	2-864-1-406	-	1799	2	6	3
10100925	152	1	2-865-1-407	-	1799	2	6	3
10100925	152	1	2-866-1-397	-	1799	2	6	3
10100925	152	1	2-867-1-420	-	1799	2	6	3
10100925	152	1	2-868-1-440	-	1799	2	6	3
10100925	152	1	2-869-1-427	-	1799	2	6	3
10100925	152	1	2-870-1-427	-	1799	2	6	3
10100925	152	1	2-871-1-418	-	1799	2	6	3
10100925	152	1	2-872-1-456	-	1799	2	6	3
10100925	152	1	2-873-1-437	-	1800	2	6	3
10100925	152	1	2-874-1-436	-	1800	2	6	3
10100925	152	1	2-875-1-431	-	1800	2	6	3
10100925	152	1	2-876-1-432	-	1800	7	6	3
10100925	152	1	2-877-1-441	-	1800	7	6	3
10100925	152	1	2-878-1-455	-	1800	7	6	3
10100925	152	1	2-880-1-645	-	1800	2	6	3
10100925	152	1	2-881-1-624	-	1800	2	6	3
10100925	152	1	4-882-0-028	11010102220	1808	2	6	3

Table 4.20b Illustrative Example Linkage 2:
Stage 4: Division of Blocks (B) into Sub-Blocks (SB)

CHAIN	B	SB	NID	BPC	EYB	MSC	OFC	OSC
			Linkage Variables					
10100925	152	2	2-834-1-187	-	1792	4	9	3
10100925	152	2	2-835-1-161	-	1793	4	9	3
10100925	152	2	2-837-1-226	-	-		-	-
10100925	152	2	2-838-1-248	-	-		-	-
10100925	152	2	2-839-1-225	-	-		-	-
10100925	152	2	2-845-1-331	-	1799	4	9	3
10100925	152	2	2-848-1-239	-	1796		9	3
10100925	152	2	2-849-1-314	-	1797	3	9	3
10100925	152	2	2-853-1-358	-	1803	4	9	3
10100925	152	2	2-854-1-310	-	1816	4	9	3
10100925	152	2	2-855-1-300	-	1816	4	9	3
10100925	152	2	2-856-1-297	-	1807	4	9	3
10100925	152	2	2-857-1-274	-	1808	4	9	3
10100925	152	2	2-858-1-313	-	1809	4	9	3
10100925	152	2	2-859-1-292	-	1809	4	9	3
10100925	152	2	2-860-1-325	-	1808	4	9	3
10100925	152	2	2-861-1-323	-	1808	4	9	3
10100925	152	2	2-862-1-344	-	1808	4	9	3
10100925	152	2	2-863-1-438	-	1808	4	9	3
10100925	152	2	2-864-1-405	-	1808	4	9	3
10100925	152	2	2-865-1-406	-	1808	4	9	3
10100925	152	2	2-866-1-396	-	1808	4	9	3
10100925	152	2	2-867-1-419	-	1808	4	9	3
10100925	152	2	2-868-1-439	-	1808	4	9	3
10100925	152	2	2-869-1-426	-	1808	4	9	3
10100925	152	2	2-870-1-426	-	1808	4	9	3
10100925	152	2	2-871-1-417	-	1808	4	9	3
10100925	152	2	2-872-1-455	-	1808	4	9	3
10100925	152	2	2-873-1-436	-	1808	4	9	3
10100925	152	2	2-874-1-435	-	1808	4	9	3
10100925	152	2	2-875-1-430	-	1808	4	9	3
10100925	152	2	4-875-0-044	11010101010	-	-	9	3
10100925	152	3	2-877-1-534	-	1837	2	8	3
10100925	152	3	2-880-1-646	-	1846	1	4	2
10100925	152	3	2-881-1-625	-	1846	1	4	2
10100925	152	3	2-883-1-710	-	1846	6	4	2
10100925	152	3	2-888-1-630	-	1846	2	4	2
10100925	152	3	2-891-1-690	-	1845	2	4	2
10100925	152	3	2-895-1-335	-	1839	6	4	2
10100925	152	3	4-906-0-089	11010101011	1842	3	9	2
10100925	152	4	2-880-2-439	-	1854	7	4	2
10100925	152	4	2-881-2-446	-	1854	7	4	2
10100925	152	4	2-883-2-453	-	1854	7	4	2
10100925	152	4	3-884-0-012	11010101011	1857	2	4	2
10100925	152	5	4-866-0-059	11010102300	-	1	7	3
10100925	152	6	4-870-0-014	-	-	2	8	3
10100925	152	7	4-878-0-058	11010101011	-	3	-	-
10100925	152	8	4-883-0-119	11010101012	1858	2	-	-

4.6.7 Performance of the Approaches Adopted

No absolute measure of the correctness of the record linkage of the Viana data has yet been developed. Such a measure would ideally need to consider the effects of the coding, standardisation, and linkage procedures separately. Nevertheless, while to guesstimate the value of such a measure would merely provide spurious accuracy, the micro-analysis presented in Sections 4.6.3 and 4.6.4 do suggest that a figure such as the proportion of records linked correctly might be extremely high.

It is felt that by initially proceeding without the aid of sophisticated record linkage programs, the problems inherent in the Viana data have been closely understood; in this respect, the initial linkage of the muster-rolls proved invaluable. It is also felt that, as a result, the software and techniques required to overcome these problems and link the data both automatically and accurately, have been more effectively developed.

Comparing the techniques presented here with those reviewed earlier, several points are worth emphasising. First, the use of a database system has proved invaluable; more particularly, the use of the Scientific Information Retrieval (SIR) Data Base Management System (DBMS) for the storage, coding, linkage, and subsequent retrieval of the Viana data has proved invaluable. Second, although the Viana data can certainly not be described as being of high quality, the standardisation and coding process allows the individual standardisation of variables to the extent required for record linkage; any and all standardisation and coding problems can be overcome. Third, another advantage of the record linkage procedure is that the usual assumption that the likelihood of any randomly chosen pair of records pertaining to the same historical person is independent of information available elsewhere is unnecessary. By using chains and sub-chains of blocks and sub-blocks, the record linkage of clusters of records becomes possible.

On the other hand, there are two apparent disadvantages in the application of the techniques presented here. First, as demonstrated with the second illustrative example linkage of Section 4.6.6, the linkage procedure is designed so that there is sometimes a slight tendency toward over-linkage. This means that where several records share very similar characteristics (e.g. those of the three electors

with standardised full name Manuel José Rodrigues), they are simply linked together. It is argued that this design feature of the linkage procedure is not a great disadvantage. In general, slight over-linkage is preferable to under-linkage; it is reassuring to know that all the records of a particular historical person are linked together. Also, the effects of slight over-linkage can be controlled in analyses of the linked data. Where a slightly over-linked event history is analysed, the characteristics of the constituent records can be chosen to be an unbiased sample of the available characteristics.

The second disadvantage of the linkage procedure is that it may appear to be somewhat ad hoc - although the match scoring functions have been tuned to produce the desired linkage of the Viana data, they are not directly applicable elsewhere. Nevertheless, the methodology and general approach adopted are very flexible, and would therefore only require some modifications of detail in order that they might be applied elsewhere. Finally, it is again noted that the record linkage process presented here may require some further development before a full reconstitution of the whole population of Viana, incorporating the vital registration records can be attempted.

4.7 Summary

This Chapter has addressed a number of methodological and substantive issues in record linkage in general, and in the reconstitution of the Town/City of Viana in particular.

First, the economic and demographic history of the City were discussed, and local and national events in the nineteenth century were summarised in order to establish the circumstances under which the sources being used were created. Aggregate census data were used to provide an initial picture of the population, and migration to and from Viana during the nineteenth century. Then, the manuscript sources (muster-rolls, electoral registers, passport books, and cemetery lists) on which the reconstitution is currently based were described in detail.

Reconstitution methodology was introduced with a review of some record linkage studies and techniques. Record linkage studies were classified according to whether or not variation or errors or both exist in identifying items of information, and whether or not there is duplication of identifying item sets. The combination of these problems was seen to determine the approach to record linkage. Nevertheless, it was argued that whatever approach is adopted ought to be fully automatic; ensuring both that linkage criteria are carefully defined beforehand, and that those criteria are consistently applied.

Next, the use of the Scientific Information Retrieval (SIR) Data Base Management System (DBMS) for the storage, standardisation and coding, linkage, and subsequent retrieval of the Viana data was described.

Finally, the record linkage of the Viana data was described in detail. The record linkage was not presented within a formal framework because to do so lies beyond the scope of this research; however, it is fair to say that the groundwork for such a framework has been laid.

CHAPTER 5

POPULATION AND MIGRATION, VIANA, 1826-1833

5.1 Introduction

The muster-rolls drawn up in Portugal between 1826 and 1833 are the only systematically collected source of demographic data available for the country during the period 1820-1835 (Serrão, 1973:117). As such, they provide an ideal opportunity for the study of the structure of Portugal's population in the years preceding the reforms that were introduced following the advent of liberalism in 1834. In the context of this thesis, an examination of the muster-rolls of the Town of Viana provides a picture of the demographic structure and the extent of migration to and from the Town during the period. As such, the image presented will serve as a base population for the remainder of this study.

The advantage of a household listing compiled at one point in time and then repeatedly updated is that not only is it possible to examine the population at the time the document was first drawn up, but also to investigate the dynamics of the population over a period of time. In Viana, for example, an estimate of intra-urban migration can be obtained by counting the number of people who moved to a different household within the Town during the period, and the number of moves that each of these people made.

This Chapter is structured as follows. Section 5.2 covers the methodology used for the analysis of the five muster-rolls of the Town of Viana; it discusses the approach adopted to overcome the difficulties of documents initiated at different times which contain observations added in several different inks and handwritings. Section 5.3 examines the demographic and economic structure of the population of Viana, differentiating between the population recorded when the muster-rolls were initially drawn up and those who were added later. Finally, Section 5.4 examines the evidence for migration to, within, from, and back to the town in more detail.

5.2 Methodology

As described in Section 4.3.1, there are four main problems with the use of the muster-rolls' household listings[1]. First, as discussed by Brandão and Feijó (1984), the omission of many females precludes the analysis of family structure within the community[2]. Second, the five muster-rolls of the Town of Viana were actually initiated at different times, with that of the Second Company originally created around 1826, followed by the First, Fifth, Fourth, and finally, in 1833, the Third Company[3]. Third, the muster-rolls contain observations added in several different inks and handwritings. Finally, when interpreting results from the muster-rolls, it must be remembered that they cover a period including that for which Portugal was embroiled in civil war. The second and third problems are of course related in that the muster-rolls initiated earliest contain more different inks and handwritings than those initiated towards the end of the period.

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[1] In this Chapter, the use of the term "household" is restricted to its meaning at the time the muster-rolls were created. Nevertheless, considering the three phenomena distinguished by Bender (1969) (family, co-residential, and domestic function groups) the meaning here corresponds closely with that of the co-residential household.

[2] But, see Rowland (1983) for an imaginative study of two parishes (Âncora and Montaria) to the north of Viana. Using assumed fertility and mortality schedules, an estimated number of missing females is distributed among the listed households to allow an analysis of household structure. However, Rowland's results must be approached with the utmost caution for two reasons: first, they are highly dependent on the imposed schedules of fertility and mortality (unknown for early-nineteenth century Portugal); second, being derived from small parish populations, they are particularly vulnerable to the effects of stochastic variation investigated thoroughly by Wachter et al (1978). Feijó (1983), examining seven parishes of the Borough of Viana (Abelheira, Amonde, Âncora, Carreço, São Lourenco, Santa Marta, and Serreleis), therefore prefers to adhere to the available data, thus working with the minimum levels of complexity and generational depth offered by the rolls. With respect to this research, the hitherto unresolved difficulties involved in the identification of the different inks and handwritings do not currently allow the analysis of household structure.

[3] Unless specified on a muster-roll, the year in which it was initiated is taken to be the earliest for which an observation was explicitly dated, leading to: 1826, 1827, 1832, 1833, and 1833, respectively. The ordering thus identified is consistent with the gradual modification in the appearance of the muster-rolls. Those of the First, Second, and Fifth Companies are very similar; that of the Fourth, while having the same format as those of the First, Second, and Fifth, rarely includes information on birthplace or parentage; finally, the muster-roll of the Third Company contains the same amount of information as that of the Fourth, but, since its format had been reorganised to fit on one rather than two sides of paper, this information was arranged in such a way as to allow the explicit recording of kinship links within households.

Although no map of the Town of Viana in the early nineteenth century is known to exist, many of the names of roads appearing on the muster-rolls have remained unchanged to date; a map has therefore been reconstructed using information and maps held in the Municipal Archive of Viana, and from the works of other researchers[4]. This map is displayed in Figure 5.1; its key appears on the following two pages, ordered numerically by road number, and alphabetically by road name, respectively.

Considering the five muster-rolls more closely, the company divisions were such that a road was sometimes divided. The roads included in each company are as follows: First Company: 1-35; Second Company: 1, 4, 36-52; Third Company: 53-61; Fourth Company: 12, 22, 62-85; Fifth Company: 52, 86-87. These company divisions are shown in Figure 5.1. Further, three households were included in two different companies: 6, Campo da Feira (road 12); and 30 and 31, Rua dos Manjovos (road 22) appeared on both the First and Fourth Companies, but with no residents in common.

With respect to the different years in which the muster-rolls were initiated, the simplest approach - an analysis of the town by parish - is adopted. In this way the two earlier muster-rolls of the First (1827) and Second (1826) Companies, which include the vast majority of the population of Santa Maria Maior, are kept together; as are the later muster-rolls of the Third and Fourth Companies (1833), which cover the whole of Monserrate. Only the Fifth Company (1832) does not fit comfortably within this framework. However, since only a part of one road of urban Santa Maria Maior is covered in this muster-roll (the rest covering the rural settlement of Abelheira in that parish and the whole of the neighbouring parish of Meadella), it is likely that any effects on the results can be assumed to be negligible. Finally, the greatest advantage of this approach is that results are comparable with those of other analyses.

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[4] Loose map of the area around the **Casa da Misericórdia** (1776) in the municipal archive; plan of the walled Town of Viana, Caldas (1919:7); **Denominação de Ruas** (1937). The help of Mary Thomas with the preparation of the resultant map is gratefully acknowledged.

Figure 5.1

VIANA DO CASTELO 1826-33

Company 1
Company 2
Company 3
Company 4
Company 5
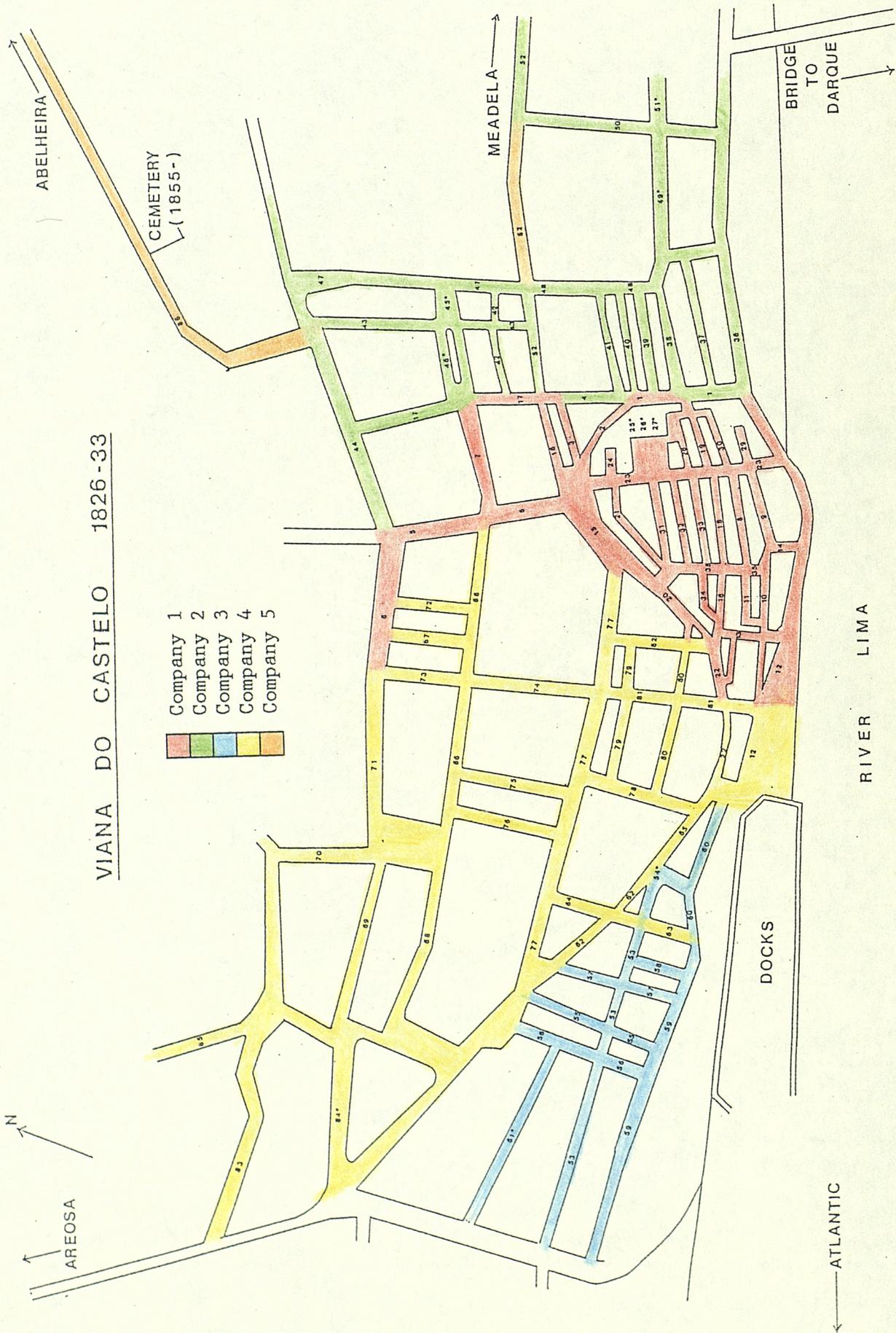
Table 5.1a Key to Figure 5.1: The Roads of Viana, 1826-1833

1	Praça das Couves	30	Rua do Villarinho	59	Rua do Castelo
2	Rua do Eirado	31	Rua do Poço	60	Rua do Marques
3	Rua das Padeiras	32	Rua do Tourinho	61	Rua de Santa Catarina
4	Rua do Espírito Santo	33	Rua das Seitaens	62	Rua de Altamira
5	Rua de Santa Anna	34	Rua da Parenta	63	Rua de Matta Mouros
6	Rua do Carreira	35	Rua do Hospital Velho	64	Quelha das Noivas
7	Rua Nova de Santa Anna	36	Rua do Pombal	65	Rua de São Bom Homem
8	Rua do Postigo	37	Rua dos Caleiros	66	Rua das Rosas
9	Rua dos Caes	38	Rua da Piedade	67	Rua das Cabaças
10	Rua de Vianna	39	Rua da Grammática	68	Rua do Lama
11	Rua do Tojo	40	Rua da Videira	69	Rua de São Thiago
12	Campo da Feira	41	Rua da Palha	70	Rua de Santa Luzia
13	Rua de São João	42	Rua Roque de Barros	71	Rua dos Cruzios
14	Travessa da Victória	43	Rua de Santo António	72	Rua Gonçalo Affonço
15	Campo do Forno	44	Rua da Amargura	73	Rua Pedro de Mello
16	Rua da Misericordia	*45	Largo de Santo António	74	Rua dos Rubins
17	Rua das Correas	*46	Rua de São João de Arga	75	Rua das Baças
18	Rua Grande	47	Rua das Larangeiras	76	Rua do Trigo
19	Rua de São Pedro	48	Rua Martim Velho	77	Rua de São Sebastião
20	Rua da Picota	*49	Largo de São Bento	78	Rua de Santa Clara
21	Travessa dos Fornos	50	Rua Nova de São Bento	79	Rua Luis Jácombe
22	Rua dos Manjovos	*51	Quelha da Papanata	80	Rua do Anginho
23	Praça Velha	52	Rua da Bandeira	81	Rua do Salgueiro
24	Fornos de Sima	53	Rua do Loureiro	82	Rua da Penha
*25	Fornos de Baixo	*54	Loureiro	83	Penedo do Baixo
*26	Arcos da Matriz	55	Travessa da Borra	*84	Rua da Portella
*27	Viella da Matriz	56	Rua de São Domingos	85	Rua de São José
28	Rua do Sequeiro	57	Travessa de Agoa	86	Rua da Avilheira
29	Rua do Caxuxo	58	Travessa do Miranda		

* These roads were not on any maps of Viana, but the sources suggest they lay where indicated.

Table 5.1b Key to Figure 5.1: The Roads of Viana, 1826-1833, in alphabetical order

57	Travessa de Agoa	47	Rua das Larangeiras	66	Rua das Rosas
62	Rua de Altamira	*54	Loureiro	74	Rua dos Rubins
44	Rua da Amargura	53	Rua do Loureiro	81	Rua do Salgueiro
80	Rua do Anginho	79	Rua Luis Jácombe	5	Rua de Santa Anna
86	Rua da Avilheira	22	Rua dos Manjovos	61	Rua de Santa Catarina
75	Rua das Baças	60	Rua do Marques	78	Rua de Santa Clara
52	Rua da Bandeira	48	Rua Martim Velho	70	Rua de Santa Luzia
55	Travessa da Borra	*26	Arcos da Matriz	*45	Largo de Santo António
67	Rua das Cabaças	*27	Viella da Matriz	43	Rua de Santo António
9	Rua dos Caes	63	Rua de Matta Mouros	*49	Largo de São Bento
37	Rua dos Caleiros	58	Travessa do Miranda	65	Rua de São Bom Homem
6	Rua do Carreira	16	Rua da Misericordia	56	Rua de São Domingos
59	Rua do Castelo	64	Quelha das Noivas	*46	Rua de São João de Arga
29	Rua do Caxuxo	7	Rua Nova de Santa Anna	13	Rua de São João
17	Rua das Correas	50	Rua Nova de São Bento	85	Rua de São José
1	Praça das Couves	3	Rua das Padeiras	19	Rua de São Pedro
71	Rua dos Cruzios	41	Rua da Palha	77	Rua de São Sebastião
2	Rua do Eirado	*51	Quelha da Papanata	69	Rua de São Thiago
4	Rua do Espírito Santo	34	Rua da Parenta	33	Rua das Seitaens
12	Campo da Feira	73	Rua Pedro de Mello	28	Rua do Sequeiro
15	Campo do Forno	83	Penedo do Baixo	11	Rua do Tojo
*25	Fornos de Baixo	82	Rua da Penha	32	Rua do Tourinho
24	Fornos de Sima	20	Rua da Picota	76	Rua do Trigo
21	Travessa dos Fornos	38	Rua da Piedade	23	Praça Velha
72	Rua Gonçalo Affonço	31	Rua do Poço	10	Rua de Vianna
39	Rua da Grammática	36	Rua do Pombal	14	Travessa da Victória
18	Rua Grande	*84	Rua da Portella	40	Rua da Videira
35	Rua do Hospital Velho	8	Rua do Postigo	30	Rua do Villarinho
68	Rua do Lama	42	Rua Roque de Barros		

* These roads were not on any maps of Viana, but the sources suggest they lay where indicated.

The muster-rolls of Santa Maria Maior contain up to six different inks and styles of handwriting which at first appeared to be fairly distinguishable. However, initial analyses of the data using these identified ink and handwriting categories yielded quite implausible results, such as intra-urban migrants "appearing" in households before having "appeared" in the household from which they had moved! Fortunately however, the inks and handwritings of the clerks who first drew up each of the muster-rolls are easily distinguished from those of any of the others, and the analysis can therefore proceed restricting comparisons to those between the population initially enumerated, and that which was later added to the rolls. In fact, as will be demonstrated in Section 5.4.3, the initial ink and handwriting were used for about four years - more than half of the period covered.

A slight complication arises with this method however, because a significant proportion of the male population, though normally resident in the Town, was not actually present when the muster-rolls were initially drawn up. For these males, only marital status and an observation concerning their absence, and hence unavailability for military recruitment, were consistently recorded. It is therefore also necessary to distinguish between those absent and those unrecorded at the time the muster-rolls were initially drawn up. With respect to return migration, this allows those who were seen to be temporarily absent and those who were seen to have made a permanent move from the Town to be considered separately.

This approach differs fundamentally from that adopted by other researchers working with muster-rolls (Rowland, 1981; Feijó, 1983), who, following the observations over time and using additional information available from muster-roll verification documents drawn up in 1833, analyse the final population of 1833. Their approach differs because they were primarily interested in the study of historical social structure, particularly household structure, while here population change and migration are the main points of focus.

Since there are so many different inks and handwritings on the muster-rolls of Santa Maria Maior, household structure, except in the initial population, cannot be investigated until each can be identified with reasonable accuracy. Even then, adjustments similar to those of Rowland (1983) would have to be made for the

non-registration of single and widowed females who were not heads of households.

The muster-rolls of Monserrate contain far fewer observations than those of Santa Maria Maior; having been drawn up in 1833, there was little opportunity for them to be updated at all before the end of the period. Analyses of the data for these muster-rolls will therefore be restricted to a description of the population initially enumerated.

Finally, considering marital status information, although hardly anyone was explicitly recorded as being single on the muster-rolls the number married is known because the name of their spouse was given, and the recording of widowhood appears to have been very consistent, so the analysis will proceed under the assumption that all those with no recording of marital state were in fact single.

5.3 The Population Recorded

This Section examines the demographic and economic structure of the population of Viana. First, the composition of the population by sex and marital status is considered in Tables 5.2 and 5.3. Table 5.2 compares the population resident in and absent from Santa Maria Maior when its muster-rolls were initially drawn up (the initial population) and those who first appeared later (the in-migrants), where these populations are identified through an analysis of the inks and handwritings[5]. Table 5.3 shows the total recorded population of Monserrate.

Table 5.2 The Initial and In-Migrant Population of Santa Maria Maior

| Marital Status | Initial Population | | | | In-Migrants | | | |
| | Sex | | | | | | | |
	M	%	F	%	M	%	F	%
Single	1125	66.2	248	31.0	405	59.7	209	43.0
Married	526	31.0	420	52.6	264	40.0	224	46.1
Widowed	48	2.8	131	16.4	9	1.3	53	10.9
Total	1699	100.0	799	100.0	678	100.0	486	100.0

Table 5.3 The Population of Monserrate

| Marital Status | Sex | | | |
	M	%	F	%
Single	829	63.4	340	49.3
Married	445	34.1	228	33.0
Widowed	33	2.5	122	17.7
Total	1307	100.0	690	100.0

The total number of in-migrants to Santa Maria Maior approaches half the initial population, clearly demonstrating considerable movement. This movement must be considered in the context of the Town's surrounding hinterland. The Minho had an agricultural economy based on the **minifundia** principle. Young men and women would regularly have been urged to leave home so as to protect the inheritance of a family's already small plot of land from further

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[5] The term "in-migration" here amalgamates those who were born elsewhere and were moving into Viana for the first time with those who were natives or residents of Viana previously and were returning there after some period away.

fragmentation. Thus Viana, the nearest large town and, at this time, a successful commercial centre, would have been a natural stage in any process of migration, either to larger cities such as Porto and Lisboa, or abroad, typically to Brazil. To illustrate this, the level of in-migration identified can be compared with the levels of in-migration found in the nearby rural parishes of Carreço and Santa Marta by Feijó (1983:144) of just 3.7% and 5% of the total registered male population respectively.

Examination of the marital status of the populations reveals that, as might be expected, in-migrants were less likely to be widows and widowers than those initially resident. However, although female in-migrants were more likely to be single, the proportion of male in-migrants who were single was lower in the in-migrant than the initial population; similarly the totals by sex suggest that in-migration of females was more likely than of males. These misleading phenomena are partly caused by the large number of male infants and children who appear in the initial population, inflating the proportion single.

Comparing Tables 5.2 and 5.3, while there is little difference between the marital status composition of the populations of the parishes, the proportion of single females in Monserrate is much higher than in the initial population of Santa Maria Maior, with more than two thirds unmarried; this figure is even more significant bearing in mind that very few young females appear on the muster-rolls at all. Essentially, this must arise because the proportion of single females who may have affected a male's availability for military recruitment was higher in Monserrate; therefore, it may suggest higher levels of illegitimacy in the parish of Monserrate.

Since all the information consistently available for the female population appearing on the muster-rolls has now been used, the analysis will henceforth concentrate on the male population of Viana in order to identify more closely the high levels of movement already suggested. Also, because a significant proportion of the male population was absent from the town when the muster-rolls were initially drawn up, and for these and some other males only marital status and an observation concerning their absence was consistently recorded, the number of persons for which age, occupation, and birthplace information is examined in this Section and Section 5.4 is

restricted. Also, it must be noted that the numbers of persons being examined usually preclude bivariate and multivariate analyses; the characteristics of the population are therefore presented individually throughout this Section, and any correlations between variables are discussed in the accompanying text.

Age distributions of the male populations (in the five-year age groups ≤4, 5-9, 10-14, etc.) are shown in Figures 5.2, 5.3 and 5.4 (the data are presented in Table 5.4).

Figure 5.2   Male Age Distribution, Santa Maria Maior,
Initial Population; 1210 Individuals
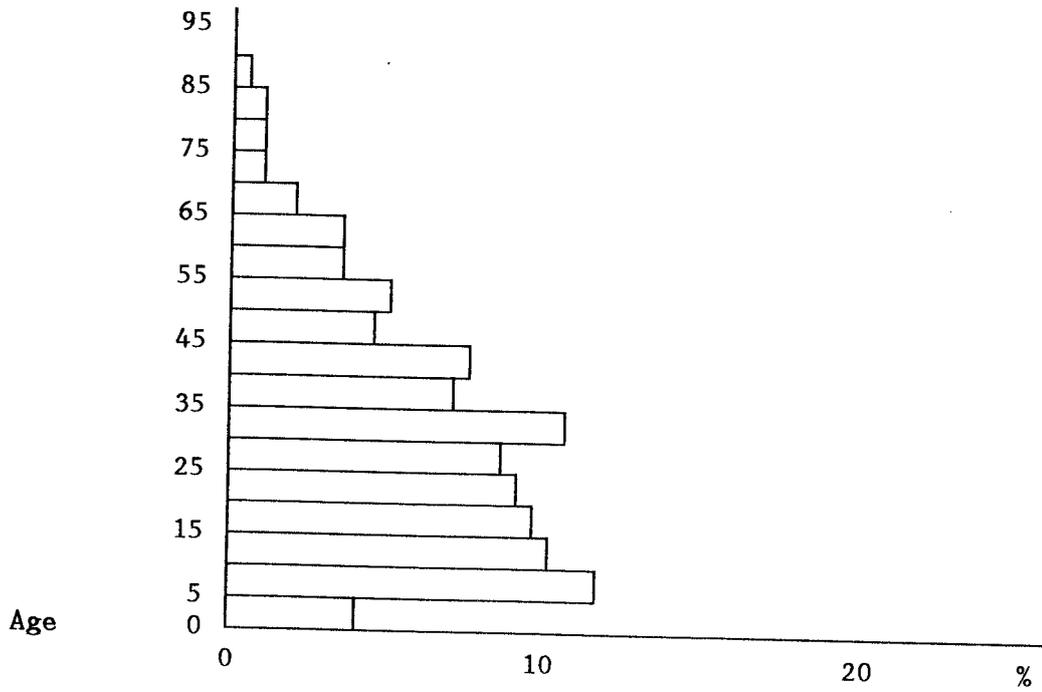
Figure 5.3   Male Age Distribution, Santa Maria Maior,
In-Migrants; 328 Individuals
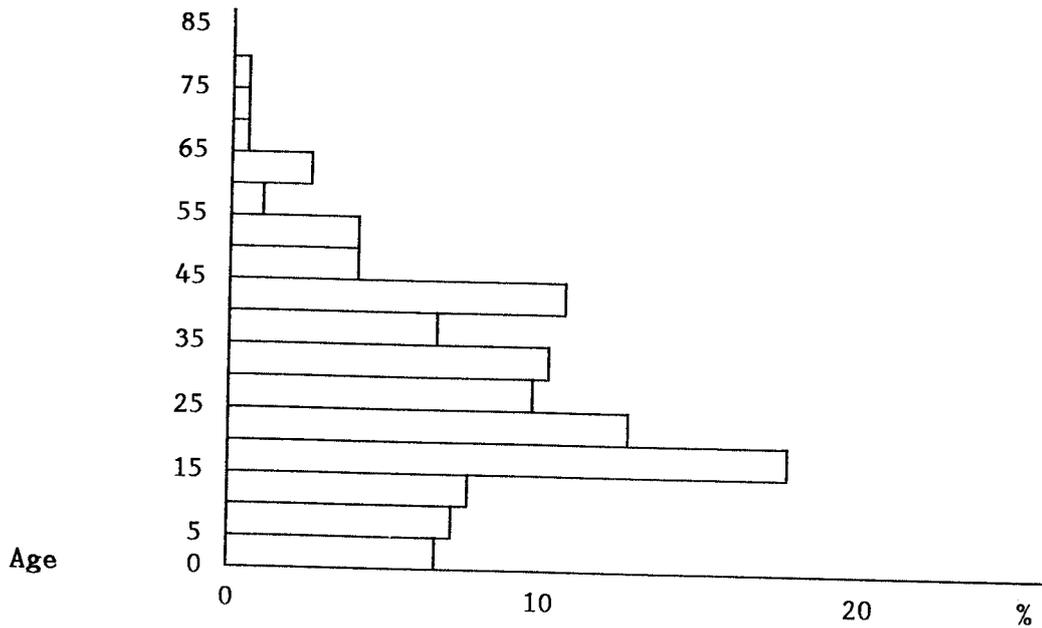
Figure 5.4 Male Age Distribution, Monserrate; 998 Individuals

Age

(y-axis: 0, 5, 15, 25, 35, 45, 55, 65, 75, 85; x-axis: 0, 10, 20 %)
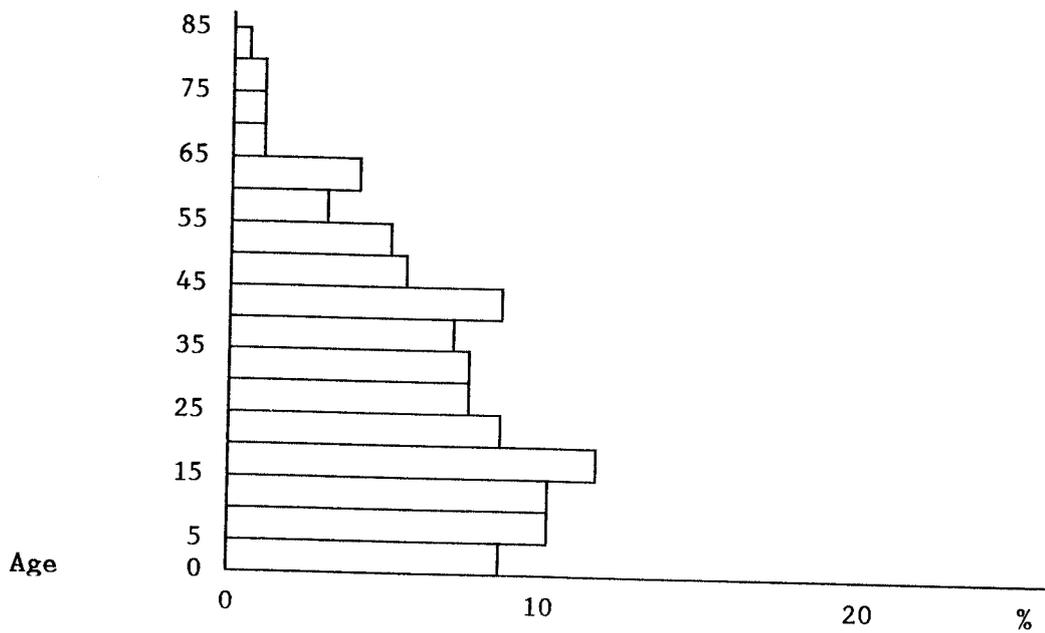
Table 5.4 Male Age Distributions, Viana, 1826-1833

Age Group	Santa Maria Maior Initial Population No.	%	In-Migrants No.	%	Monserrate No.	%
0- 4	46	3.8	22	6.7	87	8.7
5- 9	138	11.4	23	7.0	101	10.1
10-14	124	10.3	24	7.3	102	10.3
15-19	116	9.6	58	17.7	113	11.4
20-24	107	8.9	41	12.5	84	8.4
25-29	105	8.7	31	9.4	76	7.6
30-34	125	10.3	32	9.8	74	7.4
35-39	87	7.2	21	6.4	68	6.8
40-44	92	7.6	34	10.4	85	8.5
45-49	54	4.5	13	4.0	54	5.4
50-54	60	5.0	13	4.0	49	4.9
55-59	41	3.3	3	0.9	31	3.1
60-64	43	3.6	9	2.7	42	4.2
65-69	27	2.2	2	0.6	9	0.9
70-74	15	1.2	1	0.3	8	0.8
75-79	11	0.9	1	0.3	12	1.2
80-84	10	0.8	-	-	3	0.3
85-89	8	0.7	-	-	-	-
Total	1210	100.0	328	100.0	998	100.0

It is clear from Figures 5.2 and 5.4 that a delay existed between the birth of males and their addition to the muster-rolls, so that very young males were under-represented. Also, because date of birth[6] was usually recorded rather than age, the potential problem of age-heaping is minimised (where age-heaping is evident, it generally takes the form of digital preference towards ages terminating in zero).

Two major differences between the histograms are obvious. First, the age structure of the in-migrants of Santa Maria Maior is rather different from the regular age distribution of the initial population, in that there is a preponderance of young males between the ages of 15 and 25, and a lack of older males. In conjunction with the evidence from Table 5.2, this suggests the in-migration of young single males. Second, the age structure of males in Monserrate is quite different from that of Santa Maria Maior in that there is a not inconsiderable absence of males aged between 15 and 35; this is understandable when it is remembered that Monserrate housed the sea-going community of Viana. Unfortunately however, the data do not permit the quantification of these differences.

The differences between the initial and in-migrant populations of Santa Maria Maior and between the populations of the two parishes are also manifested clearly in the analysis of occupational structure shown in Tables 5.5 to 5.7.

Table 5.5 Male Occupation Sector Groups, Viana

| | Santa Maria Maior | | | | Monserrate | |
| Activity | Initial Population | | In-Migrants | | | |
	No.	%	No.	%	No.	%
Primary	66	8.9	39	9.8	109	18.3
Secondary	272	36.8	130	32.6	177	29.8
Tertiary	402	54.3	230	57.6	309	51.9
Subtotal	740	100.0	399	100.0	595	100.0
Unproductive	6		2		2	
Unknown	953		277		710	
Total	1699		678		1307	

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[6] Where date of birth was recorded on the muster-rolls, age was calculated as the number of years completed by 1 January, 1827.

Table 5.6 Male Occupation Function Groups, Santa Maria Maior

Occupation	Initial Population		In-Migrants	
	No.	%	No.	%
Agriculture	66	9.0	37	9.5
Fishing	-	-	2	0.5
Trades & Industry	304	41.4	143	36.9
Transport	70	9.5	30	7.8
Commerce	163	22.2	97	25.1
Armed Forces	24	3.3	3	0.8
Public Administration	41	5.6	25	6.5
Professions	41	5.6	12	3.1
Service	25	3.4	38	9.8
Subtotal	734	100.0	387	100.0
Unproductive/Unknown	952		275	
Ambiguous	13		16	
Total	1699		678	

Table 5.7 Male Occupation Function Groups, Monserrate

Occupation	No.	%
Agriculture	32	5.3
Fishing	77	12.7
Trades & Industry	190	31.3
Transport	194	32.0
Commerce	32	5.3
Armed Forces	21	3.4
Public Administration	21	3.4
Professions	33	5.4
Service	7	1.2
Subtotal	607	100.0
Unproductive/Unknown	690	
Ambiguous	10	
Total	1307	

The figures in Table 5.5 indicate that in Santa Maria Maior, more than half the males were engaged in the tertiary sector, while just over one third were in the secondary sector. Comparing the figures for the initial population and the in-migrants, it can be seen that in-migrants were less likely to be involved in the manufacture of goods than in the selling of them. In Monserrate too, more than half the males were engaged in the tertiary sector and almost 20% in the primary sector, at the expense of the secondary sector.

Examining the particular occupation functions of the population in more detail, Table 5.6 identifies some major differences between the structures of the initial and in-migrant male populations of Santa Maria Maior, with members of the armed forces and professions being less likely to appear, while those employed in commerce and domestic service arrived in quantity (in concordance with the large

number of single males aged 16-25 in the subsequent population). These results are to be expected as the in-migrants will have comprised many young single males moving to urban centres in order to gain employment in domestic service, to learn a trade, or to gain experience in commercial activities by working for a merchant; perhaps with a view to going on to Brazil. Table 5.7 demonstrates that the high proportion of males in Monserrate engaged in the primary and tertiary sectors is caused by the seagoing activities of that parish; those in the primary sector were usually fishermen, while those in the tertiary sector were sailors and captains of ships.

Comparing Tables 5.6 and 5.7, the differences between the two parishes of the Town of Viana are even more apparent. Over 60% of the males in the initial population of Santa Maria Maior were employed in trades & industry and commerce, while the corresponding figure for Monserrate is just over 35%. Conversely, more than half of the male population of Monserrate were either fishermen, sailors, or captains of ships, compared with just over 10% of the initial population of Santa Maria Maior. Thus, as described earlier, the two communities of Viana were quite different, despite their close proximity and economic interdependence.

5.4 Migration To, Within, From, and Back To Viana

In this Section, migration to, within, from, and back to Viana during the period 1826-1833 is discussed in more detail. In-migration is examined using birthplace data; intra-urban migration is investigated using the links constructed between different entries; and the extent of out-migration is assessed from the observations recorded on the muster-rolls; return migration is gauged using a combination of these approaches. In addition, the dependency of the first two of these three types of migration on the accuracy of the record linkage will be discussed.

Attention will henceforth be restricted to the muster-rolls of Santa Maria Maior, because no birthplace information and very few observations are available on the rolls of Monserrate.

In England, Elizabethan muster returns have also been used to investigate the extent of migration. Rich (1950) finds suggestions of "astonishing" changes in the populations of eleven parishes in Surrey by comparing the returns of 1583 with those of 1575-7; he finds that the men who answered the muster had changed by over 50%. As Buckatzsch (1950:67) points out however, "this may somewhat exaggerate the short period inconstancy of the local populations, because, perhaps even more than taxation lists and baptism registers, the muster-rolls were selective in their scope as a result of the age limit of liability to service". It is worth pointing out therefore, that these reservations do not arise with the use of the Portuguese muster-rolls during the period 1826-1833, because they essentially comprise just one (repeatedly updated) listing.

5.4.1 In-Migration

The analysis of the origins of the population of Viana presented here will serve to complete the picture of substantial in-migration suggested in Section 5.3. Birthplace information is shown in Table 5.8.

Table 5.8 Birthplaces of the Male Population of Santa Maria Maior

Place	Initial Population				In-Migrants			
	No.	%	Σ%	IM%	No.	%	Σ%	IM%
Santa Maria Maior	254	19.5			20	6.6	10.0	
Monserrate	21	1.6			6	2.0	13.0	
Town	935	71.9	71.9		116	38.1	38.1	
Borough	68	5.2	77.1	18.6	37	12.2	50.3	19.7
District	110	8.5	85.6	30.1	64	21.0	71.3	34.0
Braga District	104	8.0	93.6	28.5	44	14.5	85.8	23.4
Portugal	75	5.8	99.4	20.6	30	9.9	95.7	16.0
Elsewhere	8	0.6	100.0	2.2	13	4.3	100.0	6.9
Subtotal	1300	100.0		100.0	304	100.0		100.0
Unknown	399				374			
Total	1699				678			

Note: IM% is calculated for in-migrants (non-natives) alone.

Considering the initial population, it can be seen that less than half the males were born in the Town of Viana, the rest being in-migrants. In fact, more came from outside the Borough than from the parishes immediately surrounding the Town. Further, almost 15% were born outside the District of Viana, with 8% coming from the adjoining District of Braga alone, and 6% from other districts of Portugal further afield. The remainder came mostly from the Spanish Province of Galicia, but include some from outside the Iberian Peninsula (e.g. the one native Englishman, André Norton - Vice-Consul) who were resident in Viana. The high levels of movement identified therefore operated over long as well as short distances. Finally, a comparison of the figures for the two parishes of the Town demonstrates that it was relatively rare for people born in Monserrate to settle in Santa Maria Maior later, despite the fact that such a move would have involved only very little distance; this will be discussed in more detail in Section 5.4.2.

Turning to the in-migrant population, meaningful comparisons with the figures for the initial population can only be made if consideration is restricted to those males who were not natives of the Town of Viana itself; to this end, the columns marked IM% have been calculated. The figures clearly show that those non-natives who migrated to Viana during the period were less likely to come from further afield than had previously been the case. Among those in-migrants who were born outside the borough, the proportion of males engaged in public administration and the liberal professions was lower and the proportion engaged in trades & industry and commerce was higher than in the group of in-migrants born nearer to

Viana; this demonstrates that those who did come from further afield often did so in connection with present or prospective commercial activities. Turning to the figures for the two parishes of the Town, it can be seen that 20 of the in-migrants were specifically natives of Santa Maria Maior (and a total of 116 were natives of the Town), and were therefore either previously unrecorded, or return migrants who had not been seen to be temporarily absent at the time the muster-rolls were initially drawn up; again, this will be discussed in more detail in Section 5.4.4.

5.4.2 Intra-Urban Migration

As suggested from Table 5.8, few people born in Monserrate later settled in Santa Maria Maior, despite the fact that such a move would have involved travelling only a short distance. This is in sharp contrast with the inter-censal period 1864-1878 during which a substantial number of males aged between 16 and 40 moved from Monserrate to Santa Maria Maior (see Section 4.2.4). Intra-urban migration is further investigated by calculating the number of moves of persons with more than one entry on the muster-rolls. However, there are two caveats which must be raised in connection with such an analysis. On the one hand, it can be seen that this method is completely dependent on the record linkage process; but, given that the linkage strategy (described in Section 4.5.5) produced a minimum of accurate links rather than a maximum of potential links, it is safe to proceed bearing in mind that intra-urban migration might be slightly under-estimated. On the other hand however, the intra-urban migration of families with absent members, generating spurious intra-urban migrants, will tend to increase the estimate.

Of the initial male population of 1,699, 1,475 had only one muster-roll entry, 183 had two, and 41 had three or more, so that 13% of the initial population moved household at some point during the period; the corresponding figure among the in-migrants is 8% (624 with only one entry, 45 with two, and 9 with three or more). Of these moves, 45% (156) were within the same road, a further 23% (79) to adjoining ones, 30% (102) to another road of Santa Maria Maior, and the remaining 2% (8) to Monserrate. Of the 30% of moves to other roads of Santa Maria Maior, most were from the outskirts to more

central parts of the parish. It is interesting to note that just 33% (113) of the intra-urban migrants were in the working ages between 25 and 45; this suggests that intra-urban migration was not confined to these ages.

Thus, there was substantial intra-urban migration in Santa Maria Maior during the period, typically comprising movements of those in the working ages, and engaged in trades & industry and commerce, towards the centre of the same parish.

5.4.3 Out-Migration

The extent of movement from Viana in the period preceding 1826, and the period 1826-1833, which can be gauged from the observations is considerable. Tables 5.9 and 5.10 show the frequencies of observations made in the same ink and handwriting as that in which a person first appeared on the muster-rolls and those added at some later date, for the initial population and the in-migrants respectively.

Table 5.9 Observations of the Initial Population

Observation	Initial Ink			Later Ink		
	No.	%	Σ%	No.	%	Σ%
Absent - Rio	35	2.1	2.1	1	0.1	0.1
Absent - Brazil	50	2.9	5.0	3	0.2	0.3
Absent - Porto	7	0.4	5.4	-	-	-
Absent - Lisboa	20	1.2	6.6	1	0.1	0.4
Absent - Portugal	13	0.8	7.4	-	-	-
Absent	53	3.1	10.5	29	1.7	2.1
Departed	186	10.9	21.4	231	13.6	15.7
Dead	121	7.1	28.5	80	4.7	20.4
Total	485	28.5		345	20.4	

Table 5.10 Observations of the In-Migrants

Observation	Initial Ink			Later Ink		
	No.	%	Σ%	No.	%	Σ%
Absent	13	1.9	1.9	10	1.5	1.5
Departed	96	14.2	16.1	129	19.0	20.5
Dead	9	1.3	17.4	6	0.8	21.3
Total	144	17.4		166	21.3	

It is interesting to note that 121 males (7.1% of the initial population) were recorded as having died in the same ink and

handwriting as that in which they first appeared on the muster-rolls. The estimated crude death rate of 80‰ [7] thus derived for the period covering the use of the initial ink and handwriting might be compared with an estimate for the crude death rate for male inhabitants of the Borough of Viana in 1837, which is 21‰ [8]. The figures suggest that the period for which the initial ink and handwriting continued to be used was about four years (1826-1830). Similarly, the crude death rate for all later inks and handwritings is 66‰ [9], suggesting a further period of about three years (1830-1833). At the same time, these figures also demonstrate the care that must have been taken to ensure that the muster-rolls were at any time a true reflection of the population present in the Town.

The same reasoning may be applied to the 14% recorded as having departed elsewhere in the same ink and handwriting as that in which they first appeared on the muster-rolls. However, this figure may be less accurate than that given for mortality, since the identification of the ink and handwriting in which an observation was made is particularly difficult with this designation [10]. It is therefore possible that some of these observations were not actually recorded in the same ink and handwriting as the initial entry.

Considering the initial population, first, it can be seen that over 10% of the males were absent when the rolls were initially drawn up. Few of these were very short-term absences however - 48% of those absent were specifically recorded as having been absent in Brazil. Further, of those absent, 35% were explicitly recorded as being in a major city of Portugal or Brazil; during the period covered by later inks and handwritings, a further 2% became absent. Finally, by the end of the period a total of 25% had departed elsewhere; however, this figure includes 2% (26) that were already absent but were later seen to be unlikely to return.

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[7] This estimate takes account of the initial absence of 178 males, but no other components of population change and is therefore likely to be an under-estimate.

[8] Calculated from the **Estatísticas da População do Distrito de Viana do Castelo**.

[9] This estimate takes account of all the components of population change recorded in the initial ink and handwriting, but not those in later inks and handwritings; it too is therefore likely to slightly underestimate mortality, and must therefore be viewed with some caution.

[10] **Passou para fora**, indicating departure, was usually abbreviated to **P.p.f.**

Consideration of the in-migrants reveals that similar proportions depart elsewhere, although few of this group were ever recorded as absent. This provides evidence of substantial levels of stage migration.

Unfortunately, very little background information on the absent population can be gleaned from the muster-rolls, since it was simply not recorded. However, an examination of the 121 known occupations of the heads of households from which the 235 males were at some stage absent shows that 31% of these household heads were engaged in commerce; this compares with a figure of only 22% of all household heads. This comparison ageain suggests that commercial migration may have been an important component of migration to and from Viana.

In contrast, information available for persons who departed indicate few notable differences between the "movers" and "stayers" of the population. Out-migrants were often younger; 26% of those for whom age was recorded were between 15 and 25, and were slightly more likely to be engaged in the domestic service sector of the community or the armed forces; 5% of those for whom occupation was recorded were in the armed forces - possibly leaving to serve in the civil war.

Further, information on the destinations of out-migrants is rarely available. As can be seen in Tables 5.9 and 5.10, when a person was seen to be only temporarily absent his whereabouts were often recorded, but when persons departed elsewhere, usually only their departure (**Passou para fora**) was recorded. Even where an observation specifically records departure from the military District of Viana (**Passou para fora do Distrito**), it is not known whether the person travelled to Brazil, or merely crossed the wooden bridge over the mouth of the River Lima to the parish of Darque, less than 1km from Viana.

The figures presented here may be compared with the levels of out-migration found in the rural parishes of Carreço and Santa Marta by Feijó (1983:144) of 9.5% and 17.6% of the total registered male population respectively; these were mainly peasants and wage labourers, as indeed were the vast majority of the population in those parishes. Feijó goes on to identify the typical emigrant as male, aged less than 30, single, and not the head of a household. This is consistent with the research on Âncora and Montaria presented by Rowland (1981), who also finds evidence of out-migration to nearby

parishes, Lisboa, Spain, and Brazil but, curiously, not Porto, the rapidly growing city less than 70km away. It is interesting to note, then, that the typical out-migrant from the rural parishes studied by Feijó and Rowland (i.e. aged less than 30, single, and not the head of a household) contrasts with the out-migrants from the Town of Viana whose characteristics differed little from those of the population.

It is necessary to conclude this Section with a discussion of effects that the civil war might have had on the levels of out-migration identified. First, the tyranny of Dom Miguel is known to have been scarred by innumerable arrests, deportations, and executions (see Section 4.2.2). With respect to the muster-rolls of Viana: of 8 persons recorded arrests and imprisonments, 3 are specified as having been for political activities, crimes, and opinions; further, 4 persons are recorded as having been exiled for political crimes, and 1 is recorded as having fled. Second, the irregular army fighting on the side of Dom Miguel in the civil war - the **Voluntários Realistas** - recruited some troops from Viana. 85 males are recorded as having been **Voluntários**; however, only 8 of these were also recorded as having departed. So on the one hand, the majority of departures were not directly associated with the civil war; nevertheless, on the other hand, some are certainly likely to have been indirectly associated.

5.4.4 Return Migration

There are three indicators of return migration to Viana within the period 1826-1833 on the muster-rolls. First, there are cases where observations were explicitly made recording a person's departure and subsequent return. Second, there is the suggestion of return indicated by the number of in-migrants who were natives of Santa Maria Maior in Table 5.8. Finally, there is the evidence provided by record linkage within the muster-rolls. The last two of these three indicators are dependent on the accuracy of the record linkage process; in the second case the omission of true links, and in the third case the inclusion of false links will generate spurious return migrants. In this Section, the three indicators are therefore considered separately.

First, six people were explicitly recorded as having departed, only later to be recorded as having returned: a 20 year old tailor born in Santa Maria Maior, and his wife; a 27 year old married carpenter; a 31 year old single gardener born in Santa Maria Maior; a 45 year old single liveried servant born in Spanish Galicia; and a single cattle dealer. It is worth noting here that none of the males initially recorded as being absent in newly-independent Brazil returned to Viana during the period; this is likely to be closely associated with the civil war in Portugal.

Second, Table 5.8 indicates that 20 of the in-migrants to the Town during the period were natives of Viana - and therefore possibly return migrants. As already mentioned, this figure is entirely dependent on the record linkage process; should an entry in anything but the initial ink and handwriting have incorrectly remained unlinked to an initial entry of the same person, return migration would be wrongly increased, at the expense of intra-urban migration. Since return migration is perhaps the most important component of migration considered in this research however, particular attention was paid to the ink and handwriting identification and linkage of these potential return migrants. An examination of these 20 potential return migrants reveals that 12 were very young males being added to the rolls for the first time, and seven (from four families) had incorrectly classified birthplaces, leaving just one return migrant - José António Carvalho, a 30 year old with unknown occupation who subsequently left Viana again.

Finally, the evidence for return migration provided by record linkage within the muster-rolls is examined. Possible return migrants are identified as those persons with an observation recording absence, residence elsewhere, or departure who subsequently appeared on the muster-rolls in a later ink and handwriting. Of the 7 recorded as absent, 6 did not return during the period - their families moved within Viana and their continued absence was recorded at the new address (this was also the case for all the 4 recorded as resident elsewhere). The family of the remaining person - António Ribeiro, born in 1812 - also moved within Viana, but no observation of his continued absence is recorded; of course, this could simply be a mistake. Similarly, it is difficult to determine how many of the 40 recorded as having departed were actually return migrants; in fact, the problem of identification is somewhat worse with this

observation, because it is possible, indeed likely, that departure may sometimes merely signify intra-urban migration. Of these 39, 21 are recorded as having departed on more than one, including the last - of their muster-roll entries; these are most likely to be spurious return migrants generated by the inra-urban migration of their familes. The other 18 are not recorded as having departed on their last muster-roll entry; however, because their entries are at different addresses, it is quite likely that most of them were intra-urban migrants rather than return migrants. Finally however, 4 of these 18 are actually recorded as having departed from the military District: a 23 year old military drummer, a 27 year old military scribe, a 13 year old male, and a 27 year old married carpenter - José da Cunha Ferreira - who, after 6 intra-urban moves (including one that his wife is likely to have made in his absence) departed again, only to be specifically recorded as having returned once more (as mentioned previously).

In conclusion, the level of return migration to Viana during the period 1826-1833 was almost certainly low. This is in sharp contrast with the level of out-migration from the Town. In fact, it is reasonable to suggest that the levels identified may be atypical of early-nineteenth century Viana; the civil war may have simultaneously caused an increase in out-migration and a decrease in return migration. Further evidence of return migration is provided in Chapter 7 through the record linkage of the muster-rolls and other documents - electoral registers, passport books, and cemetery lists.

5.5 Summary

The preceding analysis of the muster-rolls has demonstrated the substantial differences that existed between the two parishes of the Town of Viana during the period 1826-1833, while providing evidence of high levels of migration to and from the Town.

A comparison of the population characteristics of the two parishes showed the extent to which males in Santa Maria Maior were more likely to be engaged in trades & industry or commerce, while those of Monserrate were more likely to be engaged in activities associated with the sea.

Also, a comparison of the initial population and in-migrants to Santa Maria Maior showed that before and during the period the level of in-migration was high; in-migrants were more likely to be younger, and, more importantly, were more likely to be engaged in commerce or domestic service. Further, in-migration was demonstrated to have operated over long as well as short distances, with longer-distance in-migrants being more likely to have been engaged in commerce. The level of intra-urban migration was also high, typically comprising movements of those in the working ages, and engaged in trades & industry and commerce, toward the centre of the same parish; this is in sharp contrast with the inter-censal period 1864-1878 during which a substantial number of males aged between 16 and 40 moved from Monserrate to Santa Maria Maior. The level of out-migration was extremely high, with males often being absent from primarily commercial households, and departing males often being drawn from the younger ages and those engaged in domestic service or the armed forces. Finally, the level of return migration to Viana during the period was low. Particularly with respect to the latter two components of migration, it is suggested that their levels were atypical because of the civil war.

CHAPTER 6

EVIDENCE OF MIGRATION TO AND FROM VIANA, 1835-1922

6.1 Introduction

The analysis of the muster-rolls presented in Chapter 5 demonstrated the substantial levels of migration to and from Viana that existed during the period 1826-1833. However, due to the nature of the muster-rolls, comparatively little is known about the destinations of out-migrants, and virtually nothing is learnt about the mobility of the female population.

In this Chapter, evidence of migration is presented which allows these issues to be addressed. Two main components of migration to and from Viana during the period 1835-1922 are examined. First, trends in in-migration are identified from birthplace information recorded on the cemetery lists. Second, trends in emigration are identified from the passport books. Unlike the muster-rolls, both the documents used here were compiled for the whole population of Viana; nobody was specifically excluded from appearing. However, considering the passport books, clandestine emigrants remain elusive. Further, neither of the analyses presented here is dependent on the record linkage process; they are performed on data aggregated from the manuscript sources.

Finally, it is necessary to point out that two components of migration lie beyond the scope of this Chapter: return migration and repeat migration. These components are entirely dependent on the record linkage process, and are therefore only discussed in the context of migration of the elite (Chapter 7), for whom the record linkage described in Chapter 4 is most accurate.

6.2 In-Migration

As described in Section 4.2.5, the only evidence of in-migration to the City of Viana during the nineteenth century hitherto available was that provided by the aggregate data presented in the census of 1890, which classifies the population as resident in: a) the borough in which they were born, b) another borough of the same district, c) a different district of Portugal; and d) the number born in another country. In this Section, the birthplace information recorded on the cemetery lists of the period 1855-1922 is examined using the same classification.

Some important caveats in the analysis of these data must be emphasised. The birthplaces appearing on the cemetery lists are not representative of the population of Viana at any time, but comprise cohorts selected through mortality; thus the older population is likely to be over-represented while the younger population is under-represented. Further, the timing of in-migration is impossible to assess with any accuracy from these data; it is not actually known whether a 40 year old man born in Braga and buried in Viana's cemetery had lived in the City most of his life, had moved to the City recently, or was only visiting the City temporarily. In the same way, the recorded characteristics of persons buried only provide information on that person's age, marital status, occupation, etc., at the time of death. Of these characteristics, only occupational information may present meaningful additional knowledge with respect to in-migration. Finally, and perhaps most importantly, the exclusion from the analysis of individuals who were at some point resident in Viana, but who were not buried there, will introduce some selection bias; for example, stage migrants from Viana's hinterland are omitted. Nevertheless, over a period of more than 70 years, it is expected that general trends in in-migration to the City of Viana will be identified with reasonable accuracy.

Birthplaces of males and females buried in Viana's cemetery during periods spanning 1855-1922 are shown in Table 6.1.

Table 6.1 Birthplaces (%) of Males and Females Buried in Viana's Cemetery, 1855-1921

Birthplace	Period											
	1855 1862		1863 1875		1876 1885		1886 1895		1896 1905		1906 1922	
	Sex		Sex		Sex		Sex		Sex		Sex	
	M	F	M	F	M	F	M	F	M	F	M	F
Santa Maria Maior	53	55	36	46	30	37	23	26	28	31	31	32
Monserrate	25	26	20	21	17	18	14	17	16	21	20	22
City	78	81	56	67	48	55	48	57	45	54	52	56
Borough	4	3	8	7	12	11	14	12	17	14	13	14
District	7	7	10	12	14	14	16	12	16	16	13	15
Braga District	3	3	8	5	10	6	6	6	7	5	5	4
Portugal	7	4	15	6	12	11	13	10	12	8	14	9
Elsewhere	1	1	3	3	4	3	3	3	3	3	3	2
Subtotal (%)	100	100	100	100	100	100	100	100	100	100	100	100
Subtotal (Known)	877	931	899	1128	714	945	786	886	687	896	1426	1635
Unknown	7	10	19	3	17	7	18	20	22	7	28	20
Total	884	941	918	1131	731	952	804	906	709	903	1454	1655

Note: Burials in the period 1855-1862 include those of minors; thereafter only adults.

It is noted that in the first period (1855-1862) the cemetery lists included all burials, while thereafter separate lists were kept for adults and minors; in the periods spanning 1863-1922 only the birthplaces of adults buried in Viana's cemetery are shown. It is therefore expected that the proportion of burials to natives of Viana will be substantially higher in the period 1855-1862.

First, the figures indicate very little change over time. Second, comparing male and females, it can be seen that the level of female mobility was substantial - often approaching that of males. In particular, there is no evidence to suggest that females were more likely to have migrated over shorter distances than males. One possible explanation for this may lie in the extent to which movement comprised family migration. Further, an analysis of the occupations of persons buried provides additional insight into the migration process. Considering males, of those engaged in agriculture, 38% were born in the City[1], while a further 29% had migrated to Viana from its surrounding rural parishes. At the same time, broadly speaking, those born nearer to Viana were more likely to have been engaged in agriculture and trades & industry, while those born further afield were more likely to have been engaged in commerce or the armed forces. Turning to females, interaction between birthplace and occupation is a little more difficult to identify because 36% of females were engaged in domestic service[2], and a further 43% had unknown or unclassified occupations. Nevertheless, with respect to those engaged in domestic service, there is again no evidence to suggest that they were more likely to have migrated over shorter rather than longer distances.

Finally, the data also provide some evidence of differential levels of out-migration between the sexes and between the two parishes of Viana. On the one hand, it is known that the sex ratio at birth is of the order of 1.05 - generally declining thereafter as a result of mortality differentials; also, in the two censuses years

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[1] Of the 38% engaged in agriculture who were born in the City, 81% were born in Santa Maria Maior. It is likely that many of them were born in the rural settlement of Abelheira, which for the purposes of administration was considered to be part of Santa Maria Maior.

[2] The domestic service occupation function group for females includes those who were recorded as being housewives, etc.

1864 and 1878, the population sex ratio was 0.82 and 0.80, respectively. On the other hand, from the figures in Table 6.1, it can be seen that the number of burials of males born in Viana is always less than that of females - the sex ratio is 0.76 for the whole period (0.75 for natives of Santa Maria Maior; 0.76 for those of Monserrate). Thus there is strong evidence to suggest that the level of out-migration was substantially higher for males than for females. This is not particularly surprising, as it is in accordance with the literature, and particularly with the working assumptions of scholars that migration of females was negligible in comparison with that of males.

However, the data further allow effects of sex differentials in the rates of ultimate out-migration to be illustrated. Assuming a constant birth rate, a constant sex ratio at birth of 1.05, a constant sex ratio at death of 0.76 for those born into a population, and constant rates of ultimate out-migration from the population, the male rate of ultimate out-migration π_m will be related to the female rate π_f as follows:

$$\pi_m = 1 - 0.76 \cdot (1-\pi_f)/1.05 \qquad (6.2.1)^3$$

Equation (6.2.1) suggests that if 10% of females born in Viana died elsewhere, the corresponding proportion for males was 35%; if the female rate was 20%, the male rate was 42%; etc. - the higher the rate of female out-migration, the smaller the sex differential becomes. However, the absolute levels of male and female out-migration remain unknown. Nevertheless, it is known that male out-migration was substantial; in Section 5.4.3 it was suggested that 25% of the initial male population on the muster-rolls of Santa Maria Maior (1826-1833) departed elsewhere within the period the rolls cover. Therefore, this illustrative model suggests that female out-migration was far from negligible.

Proceeding in the same way, on the one hand, for the period 1795-1850, the mean number of baptisms in Santa Maria Maior was 1.6

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[3] Equation (6.2.1) is developed as follows: if of 100 females born in Viana, x died there, $\pi_f=1-x/100$; then, for these 100 females, 105 males were born in Viana and 0.76·x died there, so $\pi_m=1-0.76 \cdot x/105$; but from the expression for the female rate, $x=100 \cdot (1-\pi_f)$.

times that of Monserrate (124.6/79.5)[4]; also, in the four census
years 1864, 1878, 1890, and 1900, the population of Santa Maria Maior
was 1.4, 1.6, 1.4, and 1.3 times that of Monserrate, respectively.
On the other hand, from the figures in Table 6.1, it can be seen that
the number of burials of persons born in Santa Maria Maior often
approaches twice that of persons born in Monserrate - the ratio is
1.8 for the whole period. Thus, there is some evidence to suggest
that the level of out-migration was significantly higher for natives
of Monserrate than for those who had been born in Santa Maria Maior[5].
Further, since the previous analysis demonstrated that sex
differentials in out-migration were roughly the same in both
parishes, it is suggested that the level of out-migration of natives
of Monserrate was higher for both sexes than that of those who had
been born in Santa Maria Maior. It is not possible, however, to
estimate this differential in the same way as the sex differential,
because while the sex ratio at birth is known to remain fairly
constant over time, the ratio of the number of births in the two
parishes will certainly have been subject to secular trends in the
relative populations of the parishes, and perhaps also to secular
trends in fertility differentials between the parishes.

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[4]These data were compiled from microfilms of the baptism registers by Adrienne Steele (1988).

[5]There is no evidence to suggest that residents of Monserrate were less likely to be buried
in Viana's cemetery than residents of Santa Maria Maior.

6.3 Out-Migration - Emigration

As described in Section 4.3.3, legislation passed in 1835 provided that the particulars of passports issued by the Civil Administration of each district for travel outside Portugal at a price of 800 reis were to be recorded in Passport Books. The District Administration of Viana do Minho issued its first passport under this legislation on 8 October, 1835. During the next 60 years, 24,704 passports were issued, of which 1,522 were to residents of the Town/City of Viana itself.

Variations in the numbers of passports issued each year between 1835 and 1896 are depicted in Figure 6.1 for the District of Viana, and the Town/City of Viana alone. Several features are particularly notable. First, between 1835 and 1855, before national statistics become available, the passports issued to residents of the Town/City of Viana account for a relatively large proportion of those issued for the whole District. Third, the line representing the number of passports issued in the District of Viana can be seen to part for several years during the 1870s; the lower line here represents the passports issued to persons resident in Portugal, while the upper line also includes the large number of passports issued to Galicians at this time (see Section 3.1.2). Finally, a steady increase in emigration can be seen following the end of the war between Brazil and Paraguay (1865-1870), accompanying the increased efforts of Brazil to attract immigrants, and the weakening of the Portuguese economy in the last thirty years of the nineteenth century. Smaller peaks and troughs are sometimes attributable to local events; for example, the departure of a steam ship - the Mentor - bound for Brazil, in July, 1857.

Figure 6.1 Passports Issued to Residents of the Town/City (1)
and the District of Viana (2)
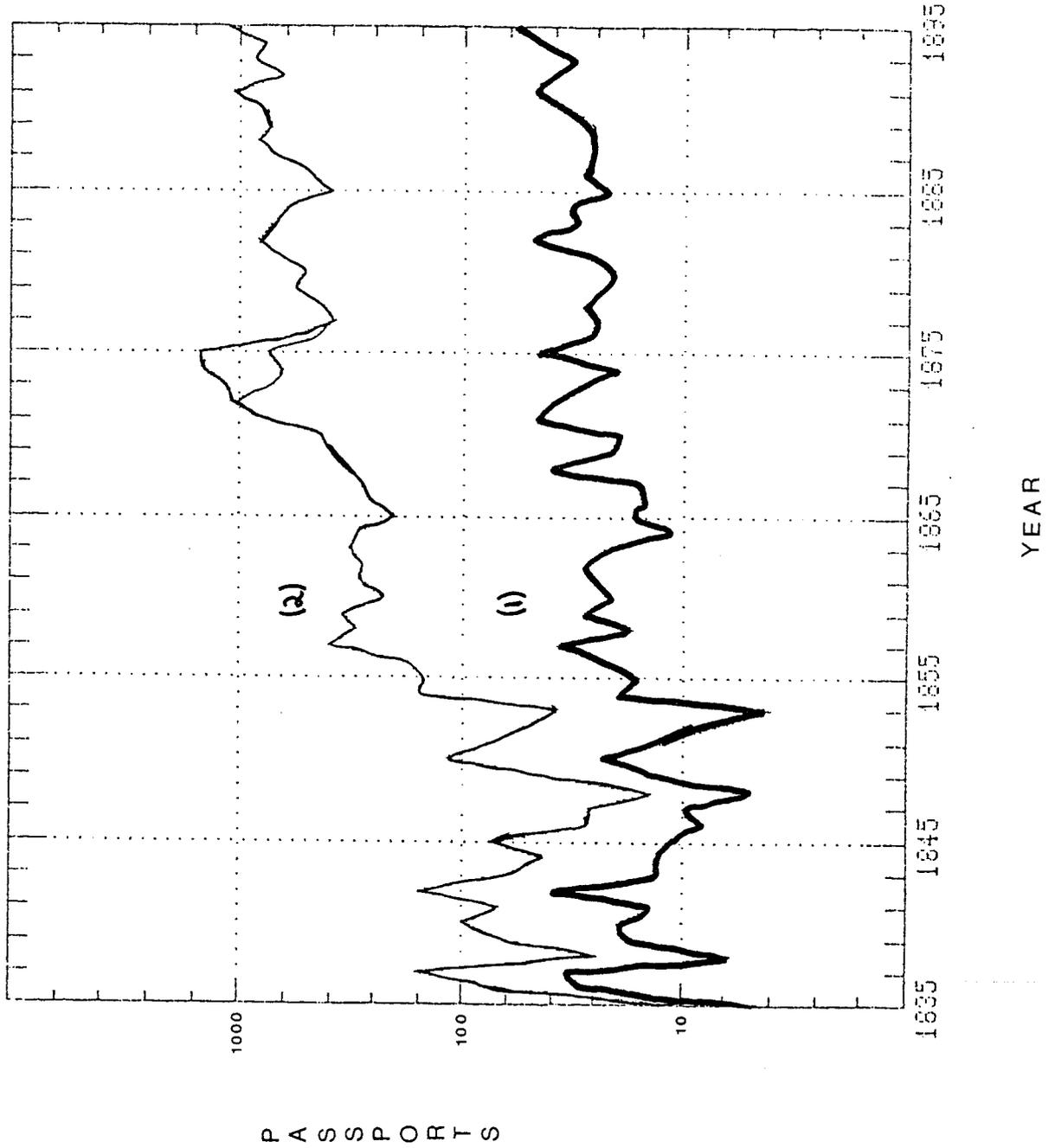
Only the most important items of information are considered here: birthplace, sex, age, marital status, occupation, date of issue, and destination. These are available for the 1,854 people who appear on the 1,522 passports issued to residents of the Town/City of Viana before 1896, when changes in the recording of information make it difficult to ascertain current place of residence accurately. The number of passports issued is cross-classified by decade of issue and sex in Table 6.2, together with the numbers of persons accompanying the passport holders.

Table 6.2 Passports Issued to Residents of Viana, 1835-1896

Decade	Passport Holders Male	Female	Accompanying a Holder Male	Female
1835-1845	198	7	25	9
1846-1855	117	3	11	5
1856-1865	219	14	23	15
1866-1875	285	13	22	17
1876-1885	272	17	26	48
1886-1896	353	24	55	76
Total	1444	78	162	170

The figures demonstrate the extent to which emigration from the Town/City comprised males departing individually. In order to investigate the characteristics of male passport holders (78% of all emigrants), the five variables age, marital status, occupation, birthplace, and destination, are examined. Their age distributions are displayed in Figures 6.2 to 6.7 (the data are presented in Table 6.3); marital status, occupation, and birthplace are shown in Tables 6.4 to 6.6, together with destination, in Tables 6.7 and 6.8. It must be noted that while temporal trends in each characteristic are examined, the numbers of persons being examined usually preclude the presentation of multivariate analyses; any correlations between variables are therefore discussed in the accompanying text.

Figure 6.2   Age Distribution, Male Passport Holders, 1835-1845

198 Ages

Age

10   20   30   40   50 %
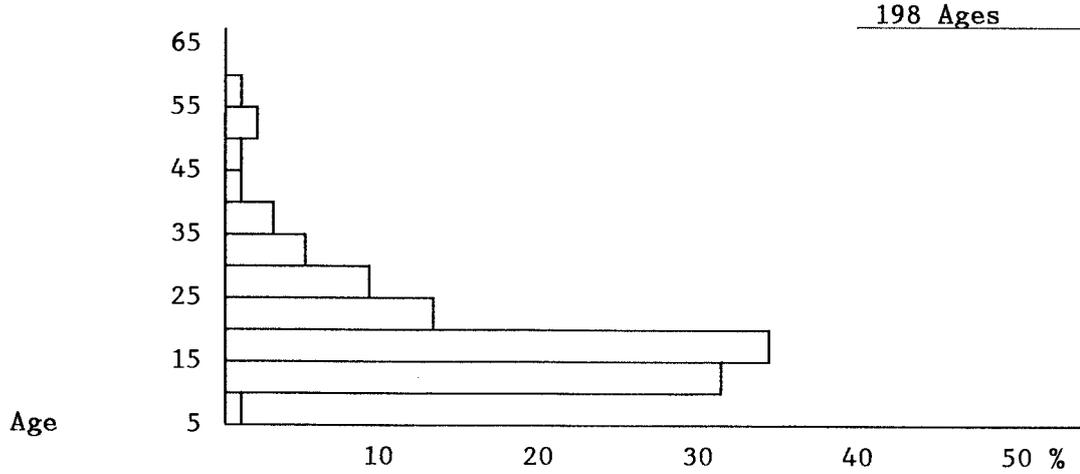
Figure 6.3   Age Distribution, Male Passport Holders, 1846-1855

117 Ages

Age

0   10   20   30   40   50 %
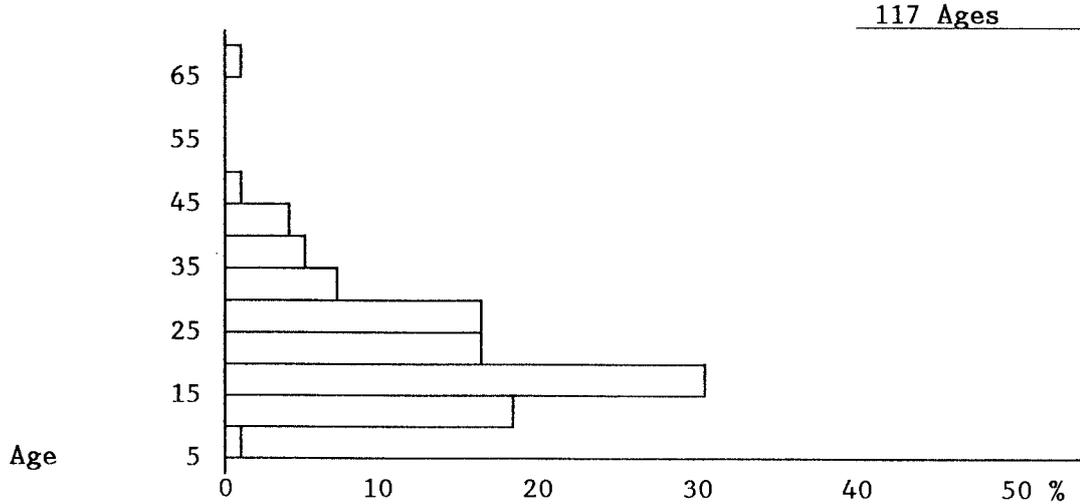
Figure 6.4   Age Distribution, Male Passport Holders, 1856-1865

219 Ages

Age

0   10   20   30   40   50 %
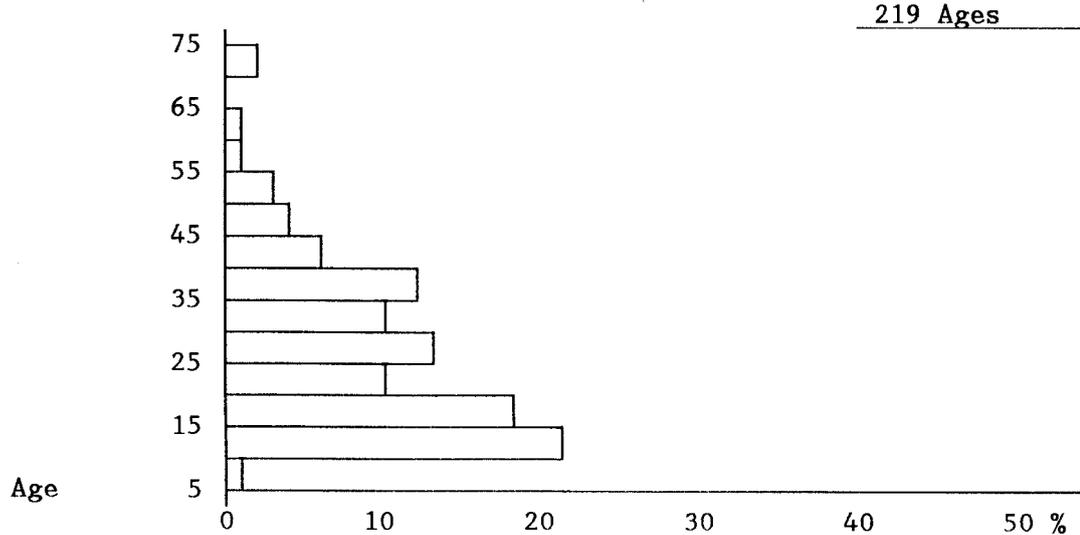
Figure 6.5   Age Distribution, Male Passport Holders, 1866-1875

285 Ages
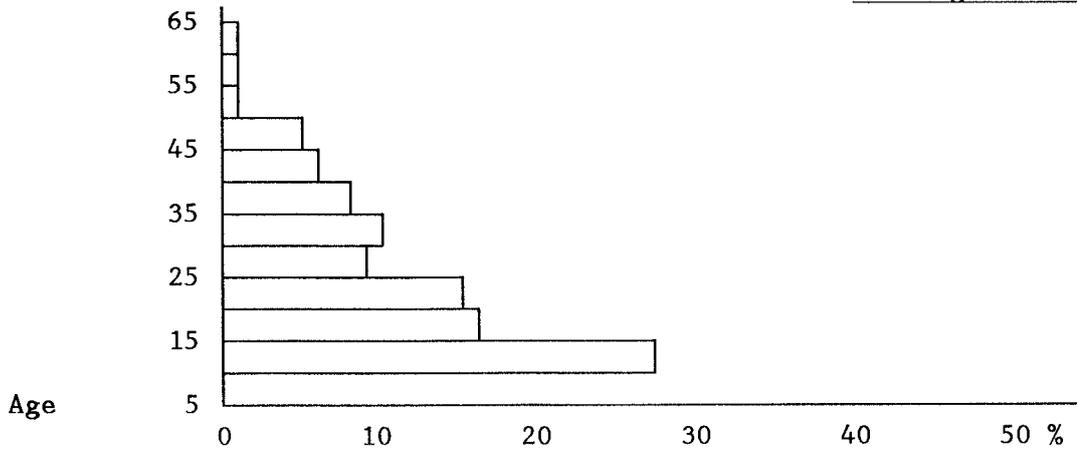
Figure 6.6   Age Distribution, Male Passport Holders, 1876-1885

272 Ages
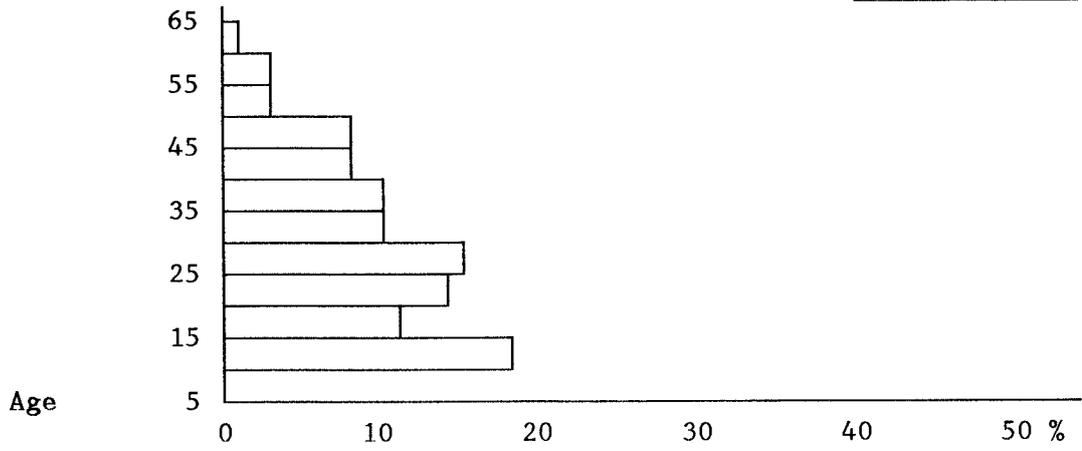
Figure 6.7   Age Distribution, Male Passport Holders, 1886-1896

353 Ages
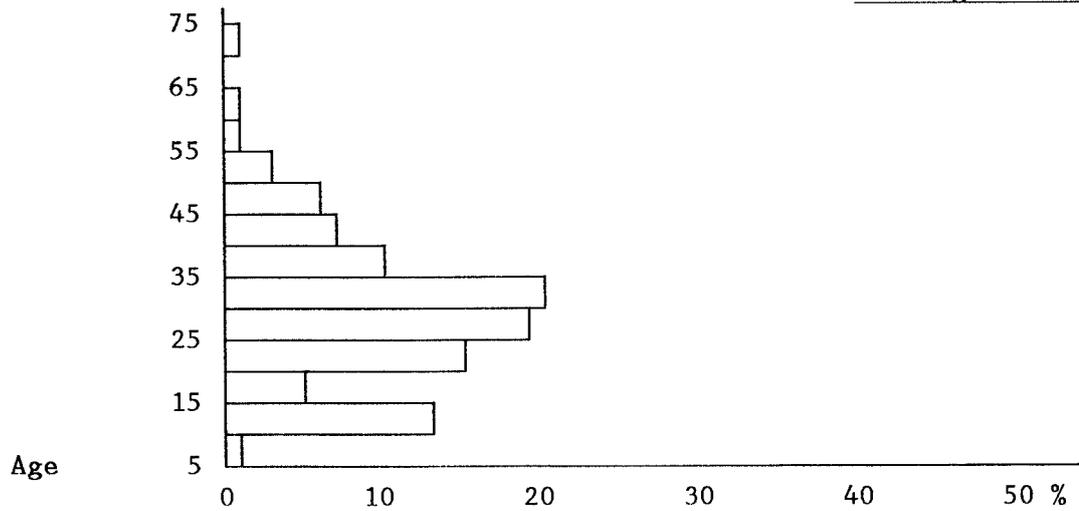
Table 6.3 Age Distributions, Male Passport Holders, 1835-1896

	Period											
	1835 1845		1846 1855		1856 1865		1866 1875		1876 1885		1886 1896	
Age Group	N	%	N	%	N	%	N	%	N	%	N	%
0- 4	3	2	1	1	3	1	2	1	-	-	8	2
5- 9	1	1	1	1	1	0	1	0	1	0	-	-
10-14	61	30	21	18	47	22	78	27	48	18	45	13
15-19	67	33	35	30	38	18	49	17	29	11	18	5
20-24	25	12	19	16	22	10	44	16	37	13	52	15
25-29	17	9	19	16	28	13	26	9	40	15	65	18
30-34	10	5	8	7	22	10	27	10	27	10	68	19
35-39	5	3	6	5	26	12	22	8	28	10	34	10
40-44	2	1	5	4	12	5	17	6	22	8	23	7
45-49	2	1	1	1	8	4	13	5	21	8	22	6
50-54	4	2	-	-	6	3	4	1	7	3	11	3
55-59	1	1	-	-	1	0	1	0	9	3	2	1
60-64	-	-	-	-	1	0	1	0	3	1	4	1
65-69	-	-	1	1	-	-	-	-	-	-	-	-
70-74	-	-	-	-	4	2	-	-	-	-	1	0
Total	198	100	117	100	219	100	285	100	272	100	353	100

Table 6.4 Marital Status, Male Passport Holders, 1835-1896

Marital Status	1835 1845		1846 1855		1856 1865		1866 1875		1876 1885		1886 1896	
	N	%	N	%	N	%	N	%	N	%	N	%
Single	172	86	99	85	161	73	212	74	176	65	206	58
Married	25	13	17	14	56	26	69	24	90	33	137	39
Widowed	1	1	1	1	2	1	4	2	6	2	10	3
Total	198	100	117	100	219	100	285	100	272	100	353	100

Table 6.5 Occupations, Male Passport Holders, 1835-1896

Occupation	1835 1855		1856 1865		1866 1875		1876 1885		1886 1896	
	N	%	N	%	N	%	N	%	N	%
Agriculture	2	2	9	8	14	6	12	6	22	7
Fishing	-	-	-	-	-	-	5	2	1	0
Trades & Industry	69	69	34	30	68	32	44	21	58	17
Transport	-	-	7	6	40	19	49	23	81	24
Commerce	21	21	45	40	79	37	72	34	127	38
Public Administration	2	2	-	-	-	-	3	1	5	2
Professions	1	1	5	5	4	2	9	4	2	1
Proprietário	4	4	8	7	7	3	18	8	35	11
Service	1	1	4	4	2	1	1	1	1	0
Subtotal	100	100	112	100	214	100	213	100	332	100
Unproductive/Unknown	215		107		71		59		21	
Total	315		219		285		272		353	

Table 6.6 Birthplace, Male Passport Holders, 1835-1896

	Period										
	1835 1845		1846 1855		1856 1865		1866 1875		1876 1885		1886 1896	
Birthplace	N	%	N	%	N	%	N	%	N	%	N	%
Santa Maria Maior	11		9		15		59		107		113	
Monserrate	7		1		9		68		90		126	
City	167	88	91	81	171	81	255	90	236	89	274	78
Borough	2	2	2	2	6	3	-	-	4	1	17	5
District	6	3	6	5	16	8	7	2	9	3	33	9
Braga District	6	3	2	2	4	2	6	2	3	1	5	2
Portugal	6	3	4	4	10	4	5	2	8	3	12	3
Elsewhere	3	1	7	6	4	2	10	4	8	3	10	3
Subtotal	190	100	112	100	211	100	283	100	268	100	351	100
Unknown	8		5		8		2		4		2	
Total	198		117		219		285		272		353	

Table 6.7 Destinations, Male Passport Holders, 1835-1896

Destination	Period											
	1835 1845		1846 1855		1856 1865		1866 1875		1876 1885		1886 1896	
	N	%	N	%	N	%	N	%	N	%	N	%
England	-		6		-		2		1		-	
France	6		1		-		-		-		-	
Gibralter	6		6		-		-		-		-	
Spain	3		-		-		5		-		1	
Europe	16	8	13	11	1	0	7	3	2	1	2	1
Africa	1	1	-	-	1	0	-	-	4	2	28	8
North America	-	-	-	-	-	-	-	-	-	-	2	1
South America	176	91	101	89	206	100	272	97	257	97	306	90
Subtotal	193	100	114	100	208	100	279	100	263	100	338	100
Unknown	5		3		11		6		9		15	
Total	198		117		219		285		272		353	

Table 6.8 Destinations within South America, Male Passport Holders, 1835-1896

	Period											
	1835 1845		1846 1855		1856 1865		1866 1875		1876 1885		1886 1896	
Destination	N	%	N	%	N	%	N	%	N	%	N	%
Amazonas	-	-	-	-	-	-	-	-	2	1	15	5
Pará	1	1	4	4	-	-	1	0	3	1	17	6
Maranhão	5	3	1	1	-	-	-	-	-	-	3	1
Ceará	-	-	-	-	-	-	-	-	-	-	-	-
Pernambuco	4	2	2	2	1	0	-	-	-	-	5	2
Bahia	10	6	8	8	1	0	-	-	2	1	4	1
São Paulo	1	1	-	-	-	-	-	-	1	0	16	5
Rio de Janeiro	143	80	75	74	17	8	12	5	11	5	149	49
Paraná	-	-	-	-	-	-	-	-	1	0	-	-
Rio Grande do Sul	1	1	2	2	-	-	-	-	-	-	-	-
"Brazil"	11	6	9	9	184	92	255	95	234	92	96	31
Subtotal	176	100	101	100	203	100	268	100	254	100	305	100
Argentina	-		-		-		-		-		1	
Chile	-		-		1		2		2		-	
Uruguay	-		-		2		2		1		-	
Total	176		101		206		272		257		306	

A comparison of Figures 6.2 to 6.7 indicates a steady shift in the primary age-groups of emigration. Initially, in the period 1835-1845, almost 70% of male passport holders were less than 21 years old; above the latter age, the number of emigrants reduced rapidly with increasing age, so that few males over the age of 40 were emigrating at all. In the second period, 1846-1855, the total number of emigrants had practically halved; this reduction however, was concentrated in the age-group 10-19, in which emigration had, in the previous decade, been concentrated.

Between 1856 and 1885, the age structure of emigration can be seen to undergo a shift from one in which very young males are predominant, to one which closely reflects the age structure of the male population from which the emigrants were drawn (except, of course, for children under the age of 10, who rarely travelled independently). At the same time the introduction of stricter legislation concerning the departure of males eligible for military conscription (aged 14-21), is shown to have had an increasing effect; by the end of the same period, relatively few males in the age-group 15-19 were leaving, while the number in the preceding age-group (10-14) was relatively high - inflated by those young males who avoided military conscription by leaving while they were still legally able to so. These young males were often being sent as **caixeiros** (discussed in Section 3.4.4), as were many of those between the ages of 14 and 21 who had succeeded in obtaining permission to leave the country.

Finally however, in the period 1886-1896, the age structure can be seen to change once more, as mass emigration from Portugal began, often with the help of assisted passages to Brazil. In this period, 37% of emigrants were aged 25-34.

The marital status figures in Table 6.4 corroborate the evidence of the age distributions. The extremely high proportion single in the period 1835-1845 are the young males previously identified. The increasing number of married males corresponds to the shift in the age structure of emigration, to one which broadly reflects the demographic characteristics of the population. And the surge in the proportion married towards the end of the period reflects once more the shift towards mass emigration. It is interesting to note, however, that the high emigration rates of younger widowed males throughout the District of Viana in 1878 (identified in Section

3.4.2) are not replicated among the inhabitants of the City itself in the period 1876-1885; the aforementioned rates were therefore a rural phenomenon; however, the lack of supplementary information forbids any speculation over its nature and causes.

Trends in the occupational structure of male passport holders between 1835 and 1896 shown in Table 6.5 are particularly interesting. However, two points must be noted in the analysis of the occupational information. First, although occupational information was recorded on less than half the passports issued in the earlier decades of the period, the majority (295; 55%) of male passport holders between 1835 and 1865 were less than 21 years old. Of these 295 youths, only 24% (72) had recorded occupations, of which 46% (33) were **caixeiros**. Second, where there is evidence of a shift in the occupational distribution of emigrants, it must be borne in mind that changing employment patterns in Viana may to some extent have been responsible.

In the first two decades, 1835-1855, the majority (69%) of male passport holders were engaged in trades & industry, following trades such as carpentering, shoemaking, tailoring, etc.; at the same time, a further 21% were engaged in commerce. Thereafter, other occupational groups were increasingly represented, mainly at the increasing expense of the proportion engaged in trades & industry. In 1886-1896, by far the greatest proportion (38%) were engaged in commerce, less than half that proportion (17%) were engaged in trades & industry, and almost a quarter (24%) were engaged in transport.

It is interesting to note that the first passport issued to a sailor was in 1861; thereafter, a further 166 followed, virtually all engaged in transport[6]. Of these, 83% (139) were born in Monserrate, only 4% (7) in Santa Maria Maior, and a further 8% (13) did not specify which parish of Viana they were born in; of the remaining 8, 2 were born in the rest of Portugal, 5 in Spain, and the other's birthplace was unknown. This is difficult to interpret unless sailors resident in Viana who departed in ships from Viana were not required to carry passports. In this case the figures demonstrate the decline in seagoing activities, and the extent to which sailors then departed from other ports. This would be in accordance with the

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[6]Captains of Ships would be in the occupation function category professions.

intra-urban migration of young males from Monserrate to Santa Maria Maior during the 1860s and 1870s. However, no evidence is available on this point.

Over the whole period, a small number of occupations accounted for the majority of emigrants. Of the 971 productive male passport holders, over half (55%; 615) followed one of the following occupations: 19% (183) were **caixeiros**, 17% (167) were seamen, 12% (116) were merchants, and 7% (70) were recorded as **Proprietários**; a further 14% (137) were carpenters, shoemakers and tailors, bringing the total to 69% (752). Considering the other 473 male passport holders, 23% (107) had unproductive occupations: 21% (99) were students, 2% (8) were described as **filho familiar** (literally: family son); and the rest had unknown occupations.

In conclusion, the occupational distributions demonstrate the extent to which emigrants were drawn from the wealthier sectors of society; there was a virtual absence of wage-labourers and day-labourers - a total of only 2.3% (33) during the whole period. Further, the figures indicate the commercial nature of emigration from Viana during the nineteenth century. Finally, the number of sailors issued with passports from 1861 may provide evidence of the decline in seagoing activities and the resultant change in employment patterns in the City.

The cross-classification of birthplace by decade in Table 6.6 is also quite informative. Because 1,194 (84%) of the 1,415 male passport holders for whom birthplace information was recorded were born in the City, the effects of random variation on the small numbers born elsewhere preclude a detailed analysis of birthplace information. However, the comparison of proportions born in the City with total proportions born elsewhere is justified.

It is clear that the proportion born in the City fluctuated considerably during the period, falling by 8% between 1835-1845 and 1846-1865, and increasing again by 10% by the period 1866-1885, before falling again by 9% by the period 1886-1896. There are two possible explanations for these fluctuations. First, they may be in line with fluctuations in the total proportion of males born in the City. Second, they may be attributed to variations in the levels of emigration among natives and non-natives of the City. Unfortunately, the data do not allow either hypothesis to be tested. However, it is worth comparing the distribution of the period 1886-1896 with that of

the census of 1890 which gives origins for the whole population of the City as: 71% born in the Borough, 13% in the District, 13% in the rest of Portugal, and 3% elsewhere. Bearing in mind that the figures relate to different populations, they suggest that perhaps non-natives (i.e. in-migrants) were less likely to emigrate than natives of the City. However, in conclusion, it is emphasised that 16% of male passport holders during the period were stage migrants.

Finally, considering the destinations of male passport holders shown in Table 6.7, the figures demonstrate that the vast majority of emigrants were travelling to South America - in fact, Brazil. At the same time, they illuminate some other important issues in emigration from Viana. First, the numbers travelling to Gibralter early in the period (1835-1855) provide some evidence of Viana's earlier commercial links[7]; later however, the Law of 27 May, 1871, suspended the need for passports for intra-European travel[8]. Second, at the end of the period (1886-1896), it can be seen that a significant proportion (8%) of male passport holders were departing for Africa; of these 28, 20 were travelling to Angola, 2 to Moçambique, and 3 to the islands of São Tomé and Cabo Verde.

A consideration of destinations within South America (Table 6.8) demonstrates that virtually all emigrants who went there were going to Brazil. Within Brazil, the analysis is hampered by the tendency of emigrants to be rather vague in giving their destinations, especially in the period 1866-1885. Nevertheless, the predominance of Rio de Janeiro can be seen at the beginning and at the end of the period. In fact, perhaps the most important characteristic of emigration to Brazil in the late-nineteenth century is identified in the distribution of destinations within Brazil for the period 1886-1896; in this period of subsidised Brazilian immigration, only 5% of those travelling to Brazil gave their destination as the São Paulo Province; even if all the 96 for whom destination with Brazil is unknown were going there, this would only be increased to 37%. There is therefore little evidence to suggest that emigrants (at

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[7] Before 1850, Gibralter was one of the seven most important ports on the Mediterranean (Thackeray, 1866; cited by Crawley, 1960:419).

[8] No explanation is available for the subsequent issue of passports to those specifiying Spain and England as their destinations.

least those from Viana) were emigrating to supplement and replace the emancipated slaves of the coffee plantations.

Having discussed the characteristics of the 1,444 male passport holders in detail, attention is briefly turned to the other 408 emigrants. First, with respect to the 78 female passport holders, apart from information on marital status, little else is known. Of the 78, 29 were single, 29 were married, 11 were widowed, and the marital status of the remaining 9 is unknown. Second, with respect to the 332 persons accompanying passport holders, 47% (158) were children, 19% (65) were wives of male passport holders, 16% (54) were younger brothers or sisters, 7% (25) were servants, 4% (14) were nephews or nieces, and the remaining 16 were grandchildren, parents, uncles or aunts, in-laws, cousins, and friends. Of the accompanied brothers and sisters, the majority (45 of 54) were male, as were most of the accompanied nephews and neices (12 of 14). Again, little is known about these emigrants, but this time it is because most of them were minors.

6.4 Summary

The preceding analyses of the cemetery lists and passport books have demonstrated the extent of in-migration to and out-migration from Viana during the period 1835-1922 for the whole of the population - excepting clandestine emigrants. However, because of the nature of the data, it is has not been possible to estimate rates of in-migration and out-migration over time.

On the one hand, the first analysis suggested substantial levels of female migration, and that the level of out-migration from Viana was significantly higher for natives of Monserrate than for those who had been born in Santa Maria Maior. On the other hand, the second analysis illustrated the virtual absence of females among emigrants until the late nineteenth century, and that natives of the two parishes of Viana were roughly equally likely to emigrate legally. Combining the evidence of both analyses, it is therefore suggested that natives of the less prosperous parish - Monserrate - were more likely to migrate to other parts of Portugal, or to emigrate without a passport. Similarly, females were more likely to migrate to other parts of Portugal, but it is unlikely that many emigrated without passports.

The analysis of the passport books further provided a detailed picture of emigration from Viana during the nineteenth century, illustrating that the majority of emigrants were single males less than 21 years old, often being sent to Brazil to avoid military conscription. Also, a significant proportion of emigrants from Viana were shown to be stage migrants, mainly from Viana's immediate hinterland, but with some from further afield.

However, two components of migration remain beyond the scope of this Chapter: return migration and repeat migration. The identification of these components is entirely dependent on the record linkage process, and is therefore only discussed in Chapter 7, in the context of migration of the elite, for whom the record linkage described in Chapter 4 is most accurate.

CHAPTER 7

MIGRATION OF THE ELITE, VIANA, 1834-1931

7.1 Introduction

This chapter examines evidence of migration among a sub-group of the population of Viana. The sub-group is defined as those individuals with recorded names consisting of three or more components who appear at least once on the electoral registers. The former part of this definition is necessary because the reconstitution of the population of Viana is currently restricted to males with recorded names consisting of three or more components. This sub-group of the population of Viana is referred to as the elite because there is known to have been an association between socioeconomic status and the number of components of Portuguese names. Of course, it is noted that for a definition of particular group this approach is somewhat simplistic; for example, individuals with three or more component names who were recorded on electoral registers with just two or less component names are simply omitted.

In studying the migration of the elite, the time elapsing between the arrival of an individual, whether by birth or in-migration, and their subsequent departure at some later date, whether by out-migration or death, is of interest. Survival analysis is a method by which the time elapsing between two such predefined events is studied. Some important issues in survival analysis are therefore reviewed with respect to the study of migration of the elite in Section 7.2. Survival analysis is introduced in its earliest form - traditional life table analysis. The development and limitations of the proportional hazards model are discussed; approaches to the problem of unobserved heterogeneity are reviewed; mixture models are considered; and finally, alternative observational plans are discussed.

In Section 7.3, several analyses are performed in order to identify the sub-group of the population of Viana defined as the elite. First, trends in the size and characteristics of the electorate of Viana are described. Second, log-linear models are

used to compare the characteristics of the electorate in the census years of 1864 and 1878 with the population from which it was drawn. Third, an analogous analysis is performed to identify the elite - the sample of the electorate with names consisting of three or more components. The elite are found to be a slightly biased sample of the electorate, weighted in favour of residents of the parish of Santa Maria Maior during the period 1850-1878, who were unmarried, and were engaged in commerce, the armed forces, public administration, or the professions.

In Section 7.4, migration of the elite is analysed through an examination of indirect and inferential evidence of temporary and permanent absence from Viana. Of course, the analysis is dependent on the record linkage of the muster-rolls, electoral registers, passport books, and cemetery lists. References to possible inaccuracies of the record linkage are therefore discussed where appropriate. First, the retrieval of a statistical file of individual life histories from the Viana Database is described. Second, restriction of the dataset is considered in the context of the circumstances under which the original manuscript sources were created. Third, several exploratory analyses of the restricted elite are described; these provide some initial insight into the generation of individual life histories, while also serving to verify the quality of the data. Fourth, indirect evidence of migration of the elite is examined; the passport book records are used to provide estimates of emigration, stage migration, return migration and repeat migration. Finally, inferential evidence of migration of the elite is examined; in particular, models of duration on the electoral registers are estimated.

Finally, in Section 7.5, the methodological and substantive issues raised, and the results of the analyses presented in this Chapter are summarised.

7.2 Survival Analysis

Survival analysis - the analysis of duration data - is a method by which the time elapsing between two predefined events is studied. Although it derives its name from its application to lifetime, or failure time data, of human beings, components, etc., it is applied far more generally in many other fields of research. The recent surge of interest in the topic has resulted in the publication of a large number of books devoted to its application (Mann et al, 1974; Gross & Clark, 1975; Elandt-Johnson & Johnson, 1980; Kalbfleisch & Prentice, 1980; Lawless, 1982; Cox & Oakes, 1984). In studying migration of the elite, the two predefined events of interest might be the arrival of an individual, whether by birth or in-migration, and his subsequent departure at some later date, whether by out-migration or death.

In this Section, survival analysis is reviewed, and its applications in the study of migration of the elite. First, the earliest form of survival analysis - traditional life table techniques - are described. Second, the development and limitations of the proportional hazards model (originally proposed by Cox, 1972), are reviewed. Third, the problem of unobserved heterogeneity is discussed, together with proposed and adopted techniques designed to incorporate its effects. Fourth, mixture models are considered. And finally, alternative observational plans are described. Throughout the discussion of this Section, precedence is given to issues of a substantive nature, at the expense of technical problems in the estimation of models.

7.2.1 Life Tables

The earliest application of survival analysis dates back to the seventeenth century, when John Graunt published the first life table in his "Natural and Political Observations ... upon Bills of Mortality". Although his table was incorrectly calculated, and was based on death records only, in technical terms, Graunt's fertile idea marks a progression from crude death rates to age-specific mortality rates[1]. In the 300 years since then, life tables have changed little in terms of appearance, but very much in terms of accuracy. They are now produced to give the probabilities of death between adjacent exact ages, conditional on survival to the lower age. In their production, age-specific probabilities or rates of mortality are usually graduated to give a smooth progression of rates which accurately reflect the underlying mortality. Further, life tables are sometimes compiled separately for sub-populations which exhibit markedly different mortality experiences; life assurance companies have long used different tables for males and females, and have more recently adopted different tables for smokers and non-smokers.

Considering the production of life tables. Theoretically, it is acknowledged that the level of mortality is a continuous function of age - expressed as the force of mortality at age x, μ_x.[2] In practise however, actuaries usually estimate either initial probabilities or central rates of mortality at each integral age x: q_x or m_x, respectively[3], from the number of deaths and corresponding exposed to risk of a population during a specified period[4]. These are then graduated, and a table is formed through the successive application

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[1] The history of life tables is documented by Benjamin & Pollard (1980:455-459).

[2] In survival analysis terminology, the force of mortality at age x, μ_x, is the hazard rate at duration t since birth, h(t); thus, $\mu_x \equiv h(t)$.

[3] The q_x are conditional probabilities - defined as the probability of an individual aged x dying before reaching age x+1; the m_x are rates - defined as the ratio of the number of deaths between age x and x+1 to the total number of years lived between age x and x+1; usually $m_x \approx \mu_{x+\frac{1}{2}}$. Unfortunately, actuaries misleadingly refer to the q_x as rates of mortality.

[4] See Benjamin & Pollard (1980:35-39).

of the age-specific probabilities of mortality[5] to some arbitrary number (usually 100,000) of births - the radix of the table.

Attempts to eliminate the need for life tables, by expressing the force of mortality as a precise mathematical function of age, date back to the early eighteenth century, when Abraham de Moivre (1725) postulated that the number of survivors at age x was a linear function of x, so that[6]:

$$q_x = -1 \; / \; (w-x) \tag{7.2.1}$$

where w is the highest age attainable. Perhaps the best known "law of mortality" however, was postulated a hundred years later by Gompertz (1825):

$$\mu_x = Bc^x \tag{7.2.2}$$

This was later modified by Makeham (1867):

$$\mu_x = A + Bc^x \tag{7.2.3}$$

More recently, Perks (1932) proposed:

$$\mu_x = \frac{A + Bc^x}{1 + Dc^x} \tag{7.2.4}$$

and:

$$\mu_x = \frac{A + Bc^x}{Kc^{-x} + 1 + Dc^x} \tag{7.2.5}$$

Without doubt however, the most promising to date is that of Heligman & Pollard (1981):

$$q_x/p_x = A^{(x+B)^c} + D \; e^{-E(\log_e x - \ln F)^2} + GH^x \tag{7.2.6}$$

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[5] Where the m_x have been estimated and graduated, the q_x are usually generated using the simple relationship $q_x = m_x/(1+\tfrac{1}{2}m_x)$.

[6] Cited by Elston (1923:70), in his extensive survey of mathematical formulae that had been used to express a "law of mortality".

Indeed, by fitting this formula to the data sets on which English Life Tables Nos.1-13 were based, Forfar & Smith (1985) attempt to identify changes in the shape of English mortality over the last 150 years. Nevertheless, since there is as yet no sound theoretical basis for a formula, there has recently been a tendency to trade the appealing simplicity and comparability of mathematical models for the greater accuracy, combined with optimal smoothness, of cubic spline graduation; this technique is used in the preparation of English Life Table No.13 for example[7].

Returning to contemporary survival analysis, while it is the force of mortality, or hazard rate that is usually the variable of interest, most studies provide data of the form used by Graunt - a set of durations, rather than the separate numbers of deaths and exposed to risk used in the preparation of national life tables. This requires the formal relationship between the hazard rate $h(t)$ and the distribution of duration $F(t)$, which is given by:

$$h_T(t) = \lim_{\Delta \to 0+} \frac{Pr(t \leq T < t+\Delta \mid t \leq T)}{\Delta} \tag{7.2.7}$$

Then, by the definition of conditional probability, and omitting the suffix T:

$$h(t) = \frac{f(t)}{F(t)} = \frac{F'(t)}{F(t)} = \frac{-d}{dt} \log_e F(t) \tag{7.2.8}$$

so that:

$$F(t) = \exp \left[- \int_0^t h(\tau) \, d\tau \right] \tag{7.2.9}$$

Now, the hazard rate at time t might be defined by a function specified by a vector of parameters, θ say. The hazard function is then written as $h(t;\theta)$. At this point it is necessary to briefly discuss the concepts and implications of such functions. To this end, attention is returned to the age pattern of mortality. In particular, the differentiation between parametric and nonparametric

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[7]See McCutcheon & Eilbeck (1977).

methods of estimation in the statistical literature can be somewhat misleading. On the one hand, the term parametric is used to describe methods which specify some functional relationship between the rates of mortality at different ages. On the other hand, the term nonparametric is used to describe methods in which, essentially, the rate of mortality is assumed to be constant within predefined age intervals. Thus, the literature describes Gompertz' function as parametric, and conventional life tables as nonparametric. However, nonparametric methods are in a sense parametric, in that they specify that the hazard rate is uniformly distributed within predefined intervals, generating a discrete step function. The point is clearly illustrated with an example: suppose that only ten-year (or even five-year) age intervals are available for the estimation of mortality, and that it is therefore assumed, for the purposes of estimation, that rates of mortality are constant within these intervals; ought the estimates really to be described as nonparametric? It is more meaningful to think of the conventional life table as representing a survival distribution which is estimated using one parameter for each integral age.

Returning to the hazard function $h(t;\theta)$, the vector of parameters θ is most often estimated using the method of maximum likelihood. In maximum likelihood estimation, the likelihood that a particular individual dies at duration t is given by the product of the probability that he survives upto duration t, and the conditional probability of death at duration t:

$$L(t;\theta) = h(t;\theta) \cdot \exp\left[-\int_0^t h(\tau;\theta) \, d\tau \right] \qquad (7.2.10)$$

The logarithm of this likelihood is easily calculated. Then, the sum of the log-likelihoods of all the observations can be taken, and maximised with respect to θ.

Now, considering a specific period of study, some individuals may have experienced the "birth" event before observation began - so that, had they also experienced the "death" event they would not have been observed at all; some individuals may have experienced both events before observation began - so that their failure time is unknown; others may not have experienced the "death" event by the end

of the observation period. These individuals are described as being left-truncated, left-censored, and right-censored, respectively. The last case is most common, and the likelihood is easily modified so that right-censored individuals only contribute information on their survival to duration t. This leads to the logarithm of the likelihood for one individual of:

$$\log_e L(t;\theta) = r \cdot \log_e h(t;\theta) - \int_0^t h(\tau;\theta) \, d\tau \qquad (7.2.11)$$

where r is an indicator variable (r=0 if the observation is right-censored; r=1 if it is not). The sum of the log-likelihoods of all the observations is then taken, and maximised with respect to θ.

These equations hold whether the hazard function is represented by a continuous distribution, a discrete step function, a cubic spline, or any combination of the three[8].

7.2.2 Proportional Hazards

The proportional hazards model, attributed to the pioneering work of Cox (1972), allows for the simultaneous estimation of the effects of several covariates on hazard rates, and therefore survival patterns. The principle of the model lies in the assumption that "the duration-specific rates or risks, for given individual characteristics, are proportional, with proportionality factors that are constant at every duration" (Menken et al, 1981:181).

Cox (1972) derives the relevant likelihood function as a product of conditional probabilities; Kalbfleisch & Prentice (1973) point out the explicit interpretation in terms of the marginal likelihood of ranks; Cox (1975) introduces the partial likelihood principle for estimation. The model has been developed further by Breslow (1972; 1974), Holford (1976), Prentice & Kalbfleisch (1979), and Kalbfleisch & Prentice (1980), among others[9]. A formal derivation of the partial

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[8]Typical continuous distributions include the Gamma, Gompertz, Makeham, Pareto, Rayleigh, and Weibull. See Gilks (1982) for an illustrative analysis using a cubic spline.

[9]Cited by Menken et al (1981:182).

likelihood of Cox's regression model through log-linear models is described by Holford (1980) and Whitehead (1980)[10].

Cox's model postulates that the covariates X of an individual affect a baseline hazard function h_0 multiplicatively, so that:

$$h(t,X;\theta,\beta) = h_0(t;\theta) \cdot e^{\beta X} \qquad (7.2.12)$$

This leads to the log-likelihood for one individual of:

$$\log_e L(t,X;\theta,\beta) = r \cdot \left[\log_e h_0(t;\theta) + \beta X \right] - e^{\beta X} \cdot \int_0^t h_0(\tau;\theta) \, d\tau \qquad (7.2.13)$$

Further, one or more of an individual's covariates might be time-dependent; denoting the covariates at time t by X(t) the likelihood is simply modified, so that:

$$\log_e L(t,X;\theta,\beta) = r \left[\log_e h_0(t;\theta) + \beta X(t) \right] - \int_0^t e^{\beta X(\tau)} \cdot h_0(\tau;\theta) d\tau \qquad (7.2.14)$$

Note however, that the $e^{\beta X(\tau)}$ term must now lie inside the integral, somewhat complicating the computation of the expression.

Illustrative analyses using the proportional hazards model can be found in Crowley & Hu (1977), Menken et al (1981), Teachman (1982), Andress (1983), Trussell & Hammerslough (1983), and Rodrígues et al (1984); the last of these has the special feature that it addresses the problem of interpreting the proportional hazards model with interaction terms. The use of the proportional hazards model is extended to associated bivariate survival distributions by Clayton & Cuzick (1985).

In conclusion, it must be noted that while the most popularly adopted method of introducing dependence on explanatory variables into survival analysis is undoubtedly the proportional hazards model, other techniques have also been developed; examples include proportional odds, accelerated lifetime, non-multiplicative hazard-based, transferred origin, and accelerated onset models (see Cox & Oakes, 1984).

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[10]Cited by Hudec (1984:319).

7.2.3 Unobserved Heterogeneity

In some instances, certain important characteristics of an individual, which have a significant effect on the hazard rate to which he is exposed, may not actually be observed; these characteristics might be physical attributes in mortality studies, psychological factors in sociological studies, etc.

It is worth illustrating the principle underlying unobserved heterogeneity with two examples from the work of Vaupel & Yashin (1985b) on "heterogeneity's ruses". First, the observed radioactivity of a sample of uranium will decline over time[11]. Uranium has two isotopes: the common isotope U238 and the rarer isotope U235 (used in atomic bombs); the latter, U235, decays faster than the former so that, over time, a sample of uranium will consist increasingly of U238 - the "less frail" isotope. Second, over time, the observed recidivism rate for former smokers who are trying to stop smoking also declines over time.

It is important to note that both these examples consider a closed, or at least approximately closed populations; i.e., it can be assumed that neither population is replenished. Of course, in the second example, even supposing that a sample of individuals who are trying to give up smoking is followed from the time of their last cigarette, there will, strictly speaking, be more than one cause of removal from the sample, so that observations are likely to be right-censored. Where the study population is open to replenishment, the selection effects of the different hazard rates on the proportion of each sub-population is obscured, and the relationship between the estimated hazard rates and the estimated proportions of each sub-population no longer hold.

Bearing in mind that the examples are a somewhat special case, in the former example, scientific analysis has identified measurable characteristics of uranium which verify the existence of the its isotopes. In the latter example, one might speculate that those who try to give up smoking comprise two subgroups - the reformed and the incorrigible, but, as yet, no variables have been measured which

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[11]This would however have to be rather a long time, since the half-lives of uranium's isotopes are of the order of hundreds of thousands of years.

differentiate between them. Nonetheless, a model can be formulated in which it is assumed that of a group of people trying to give up smoking, a proportion π, with constant recidivism rate θ_1, are reformed, while the proportion $(1-\pi)$, with constant recidivism rate θ_2, are incorrigible. Then, under the illustrative assumption of no right-censorship, the likelihood of reaching for another cigarette at time t (in the absence of further information on whether they are reformed or incorrigible) is formulated for each individual as:

$$L(t;\pi,\theta_1,\theta_2) = \pi\theta_1 e^{-\pi\theta_1 t} + (1-\pi)\theta_2 e^{-(1-\pi)\theta_2 t} \qquad (7.2.15)$$

The logarithm of this likelihood can then be taken, and maximised, to provide estimates of the three parameters specified under the postulated model[12]. Indeed, this is essentially the approach (though not the method) proposed by Blumen et al (1955), in their classic mover/stayer study of industrial labour mobility (see Section 2.2). The mover/stayer model is extended by Spilerman (1972) and Singer & Spilerman (1974); maximum likelihood estimation of the model is presented and discussed by Frydman (1984).

Of course, the subdivision of a population into homogeneous subgroups need not be restricted to the mover/stayer dichotomy. Blumen et al (1955), for example, go on to consider an arbitrary number of groups with different proneness to movement; Silcock (1954) uses a continuous distribution over individuals to describe the "rate of wastage" of labour turnover. In the study of fertility, where the existence of unobserved heterogeneity in female fecundity has long been established, it is usually represented as a continuous distribution[13]. In general insurance business, actuaries have begun to incorporate unobserved heterogeneity, usually using the gamma distribution[14].

Somewhat curiously however, unobserved heterogeneity in mortality rates has not been a subject of detailed discussion among actuaries, although its selection effects are recognised in what they

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[12] Essentially, the maximum likelihood method of estimation identifies the decrease in recidivism caused by the decrease in the proportion of incorrigible individuals.

[13] See Sheps & Menken (1973).

[14] See Hogg & Klugman (1984).

call temporary initial selection and spurious selection[15]. This is indeed strange since human populations offer easily identifiable closed sub-populations - cohorts, in which selection effects might be studied. Nevertheless, the importance of unobserved heterogeneity in mortality rates is demonstrated in recent academic research (Vaupel et al, 1979; Manton & Stallard, 1981; Manton et al, 1981; Vaupel & Yashin, 1985a; 1985b; Yashin et al, 1985). Of particular interest, Manton & Stallard (1981) suggest that the black/white mortality crossover in the U.S.A. may be a result of cohort selection effects. However, period effects are usually far more important than cohort effects[16], which may partly explain the state of commercial actuarial research. As yet, no attempts have been made to incorporate unobserved heterogeneity in life assurance or annuity business as it has been in general insurance business.

The major problem in the incorporation of unobserved heterogeneity in statistical models, is that, by definition, its distribution is unknown[17]. Usually, lacking any sound theoretical basis for a distribution of unobserved heterogeneity, researchers have used convenient continuous distributions to capture its effects; the most popular of these being the gamma and beta distributions - because of their flexibility. However, the ad hoc adoption of continuous distributions of unobserved heterogeneity is methodologically unsatisfactory, particularly since it has been suggested that the estimated effects of observed covariates may be sensitive to the distribution chosen[18]. Such considerations lead Heckman & Singer (1982a; 1982b; 1984) to propose the use of an

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[15]Temporary initial selection is recognised in life assurance and annuity business where, for example, policyholders have had a medical examination - the select rates usually converge with the ultimate rates after only a few years. Spurious selection is the phenomenon whereby unobserved heterogeneity between sub-populations which are not represented in the same proportions at different ages or policy durations or both causes the mortality rates of the total populations to appear to differ. See Benjamin & Pollard (1980:215-221).

[16]See Gilks' (1982:133-142) study of age, period and cohort effects in nineteenth and early twentieth century Swedish adult mortality - using the Gompertz function.

[17]That is, virtually all work on unobserved heterogeneity proceeds under the assumption that unmeasured covariates are independent of measured covariates. See Foster (1985) however, for work on the case where observed and unobserved covariates are correlated.

[18]See Tuma & Hannan (1984) for an illustrative analysis.

approximation - a discrete distribution comprising a finite number of mass, or support points[19]. The proposed distribution is similar to that used by Blumen et al (1955); but, their approach is different, in that they seek to optimise the number of mass points. Trussell & Richards (1985) present a critical appraisal of their work with an illustrative analysis; they find that results can be sensitive to model specification and the choice of hazard functions, concluding (:273) that "the investigator who wishes to avoid model misspecification by correcting for unobserved heterogeneity is treading on dangerous ground". The sensitivity of duration models to misspecified unobserved heterogeneity and duration dependence is discussed in detail by Ridder (1987). Nevertheless, Manton et al (1986), evaluating alternative models for the (unobserved) heterogeneity of mortality risks among the aged[20], conclude that, since heterogeneous models may be constructed to be generalisations of homogeneous models, if heterogeneity parameters prove to be significant in a hierarchical series of tests, then failure to utilise the heterogeneous form of the model is a serious analytic error.

An alternative approach to the incorporation of unobserved heterogeneity, and one which has particular applications within the context of this research, is the fitting of mixture models.

7.2.4 Mixture Models

Mixture models in survival analysis can be formulated by postulating that the hazard function is best represented by a mixture of two or more other functions. Returning to the example of the observed recidivism rate for former smokers who are trying to stop, it can be seen that equation (7.2.15) is in fact a mixture of two exponential distributions. Thus, models of discretely distributed unobserved heterogeneity, ranging from the dichotomous mover/stayer model of Blumen et al to the models with an optimal number of support

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[19] Cited by Trussell & Richards (1985:243).

[20] Manton et al (1986) compare three distributions of frailty: the gamma distribution, the inverse Guassian distribution, and a degenerate distribution.

points of Heckman & Singer, are mixture models. Redner & Walker (1984) present a concise review of methods of estimating the parameters of mixing distributions[21].

Further, the application of mixture models can be extended to cases in which individuals face two or more different hazards at the same time - competing risk situations. To illustrate this concept, the development of a migration/mortality model with applications to this research is described. Several assumptions serve to define the example:

(1) Individuals are observed between age 25, and the age at which they leave the population, or are right-censored.
(2) Each individual is exposed to a mortality or death hazard $hd(a;\Phi)$ which depends on age only.
(3) Each individual is also exposed to a migration hazard $hm(a,X;\theta,\beta)$ which is dependent on age, and a set of fixed individual characteristics, represented by a vector of covariates X, which affect the hazard multiplicatively.
(4) The two hazards (migration/mortality) are independent.

Then, following previous notation, the log-likelihood for one individual would be:

$$\log_e L(a,X;\Phi,\theta,\beta) = r \cdot \left[\log_e hm_0(a;\theta) + \beta X + \log_e hd(a;\Phi) \right] -$$

$$e^{\beta X} \cdot \int_{25}^{a} hm_0(\tau;\theta)\ d\tau + \int_{25}^{a} hd(\tau;\Phi)\ d\tau \qquad (7.2.16)$$

Further, the death hazard might be represented by the Gompertz function, so that:

$$hd(a;\Phi) = \Phi_1 \cdot \Phi_2^a \qquad (7.2.17)$$

and, the migration hazard might be represented by the logistic distribution[22], so that:

$$hm(a,X;\theta,\beta) = \frac{\exp\{-(a-\theta_1)/\theta_2\}}{\theta_2 \cdot [1+\exp\{-(a-\theta_1)/\theta_2\}]^2} \cdot e^{\beta X} \qquad (7.2.18)$$

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[21] See Lindsay (1981) for properties of maximum likelihood estimators of mixing distributions.

[22] See, for example, Johnson & Kotz (1970).

In this case, both hazards are integrable, with integrated hazard functions $Hd(a;\Phi)$ and $Hm_o(a;\theta)$, written as:

$$Hd(a;\Phi) = \int_{25}^{a} hd(\tau;\Phi) \, d\tau = \Phi_1 \cdot (\Phi_2^a - \Phi_2^{25}) / \log_e \Phi_2 \qquad (7.2.19)$$

$$Hm_o(a;\theta) = \int_{-\infty}^{a} hm_o(\tau;\theta) \, d\tau - \int_{-\infty}^{25} hm_o(\tau;\theta) \, d\tau =$$

$$1/[1+\exp\{-(a-\theta_1)/\theta_2\}] - 1/[1+\exp\{-(25-\theta_1)/\theta_2\}] \qquad (7.2.20)$$

so the log-likelihood in (7.2.16) can be written explicitly; of course, if the model were modified to include time dependent covariates, this would not be the case.

However, the estimation of such models can be fraught with difficulties. Lawless (1982:255) mentions several problems of mixtures models using continuous distributions, especially those also incorporating dependency on explanatory variables; with respect to the above model, these include the number of parameters and possible flatness of the log-likelihood function. He suggests (:259) that in these cases discrete step-function methods can be applied, according to the aims of the analysis.

In some cases, the fourth assumption of the above model is violated; the two competing hazards or risks might not be independent; for example, the occurrence of one might affects the hazard of the other. In order to approach this problem, Schweder (1970) introduces the concept of local dependence. Methods of estimating hazard rates in this situation are developed by Aalen et al (1980), Johansen (1983), and in an illustrative analysis by Courgeau & Lelièvre (1984).

7.2.5 Alternative Observational Plans

As mentioned in Section 7.2.1, normally studies provide data of the form used by Graunt - a set of durations; in general, these may be durations to the event of interest, or right-censorship. However, sometimes exact durations are not available. For example, during the period of study a population may be observed only at discrete times, separated by equal intervals, or perhaps even intervals of variable length. In this case, the census enumerations provide a set of dates, or times at which the characteristics of each particular individual are observed. Thus, it may be known that an event of interest occurred between two particular consecutive times of observation, but the actual duration at which the event occurred will be unknown. Where the event of interest removes individuals from the study population, it may be known that an individual was present at a particular time of observation, and that the same individual was no longer present at the subsequent time of observation; from this information it can be inferred that the event of interest occurred between these two consecutive times of observation.

In fact, the type of observational plan just described is particularly relevant to this research. Information concerning the presence of members of the elite of Viana is usually available from their appearance on electoral registers. In the case of death or emigration with a passport, duration is available from the date recorded on the cemetery lists or in the passport books; however, in the case of out-migration to other parts of Portugal, it is only known that the event occurred between the compilation of two particular electoral registers. Thus, assumption (1) of the model developed in the previous Section (7.2.4) is violated, and must be modified. Of course, where electoral registers are available annually, the effect will be less important than where two consecutive registers span a period of more than one year (e.g. 1895-1911).

In order to incorporate the information available from such observational plans, the likelihood function must be modified slightly. Suppose that it is known only that the event of interest occurred between times u and v; then the basic likelihood for a particular un-right-censored individual will be of the form:

$$L(u,v;\theta) = \left[1-\exp\left[-\int_u^v h(\tau;\theta)\, d\tau\right]\right] \cdot \exp\left[-\int_0^u h(\tau;\theta)\, d\tau\right] \qquad (7.2.21)$$

This is a straightforward modification of (7.2.10), and can be developed to incorporate right-censorship, proportional hazards, unobserved heterogeneity, mixture distributions, etc.

Unfortunately, presumably because such observational plans are relatively rare, few statistical packages are equipped to estimate the required models directly, and the researcher is faced with two alternatives: develop appropriate software, or assume that the event of interest occurred at some particular time during the interval in which it is known to have occurred - perhaps half way through it.

7.2.6 Summary

The preceding discussion introduces three important issues in survival analysis: the concept of a hazard function, methods of representing the dependence of a hazard function on explanatory variables, and the effects of unobserved heterogeneity. The extension of survival analysis to the more general study of the timing of one or more events - event history analysis - is not covered.

With respect to the study of migration, very little work has been done using the techniques of survival or event history analysis; in their review of demographic event history analysis, Hobcraft & Murphy (1985) mention only Hobcraft (1980), Pickles (1984), Davis (1984), and Courgeau & Lelièvre (1984).

Finally, the remarks of Elandt-Johnson & Johnson (1980:181) provide a fitting conclusion to this Section: "Statistical theory provides us with many clues for designing useful methods of fitting [parametric survival functions]. The theory is, however, too closely based on assumptions of stochastic stability, to be applied directly and unquestioningly to most data encountered in survival analysis. ... What we usually wish to obtain is a distribution giving survival probabilities as close as possible to the observed proportions, without taking too seriously assumptions about the way in which these proportions came to be observed".

7.3 Identification of the Elite

In this Section, several analyses are performed in order to identify the sub-group of the population of Viana defined as the elite. First, trends in the size and characteristics of the electorate of Viana are described. Second, log-linear models are used to compare the characteristics of the electorate in the census years of 1864 and 1878 with the population from which it was drawn. Third, an analogous analysis is performed to identify the elite - the sample of the electorate with names consisting of three or more components.

7.3.1 The Electorate of Viana, 1834-1931

This Section seeks to identify the electorate in more detail, following the changes in electoral legislation, and thereby developing a picture of who the electorate might have been. Trends in the size and characteristics of the electorate between 1834 and 1931 are examined in order to investigate its development, and more importantly, to identify the effects of the electoral legislation outlined in Section 4.4.2.

Electoral registers are available for the years 1834-1878, 1880, 1881, 1883, 1888, 1891, 1894, 1895, 1911, and 1931. They were compiled by parish. In many years (1843-1845, 1849-1878), the registers of Monserrate were supplemented by the military garrison stationed in the small castle. Also, between 1866 and 1878, the registers of Santa Maria Maior were supplemented by employees of the external finance office of the customhouse. The numbers of electors in each of these four groups are depicted in Figure 7.1 (data in Appendix 7.A)[23].

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[23]Figure 7.1 only shows the numbers of electors up to 1888, since only a few infrequently compiled registers are available thereafter.

Figure 7.1 The Electorate of Viana, 1834-1888

Key: (1) Permanent residents of Santa Maria Maior
      (3) Employees of the customhouse
      (2) Permanent residents of Monserrate
      (4) Stationed in the military garrison
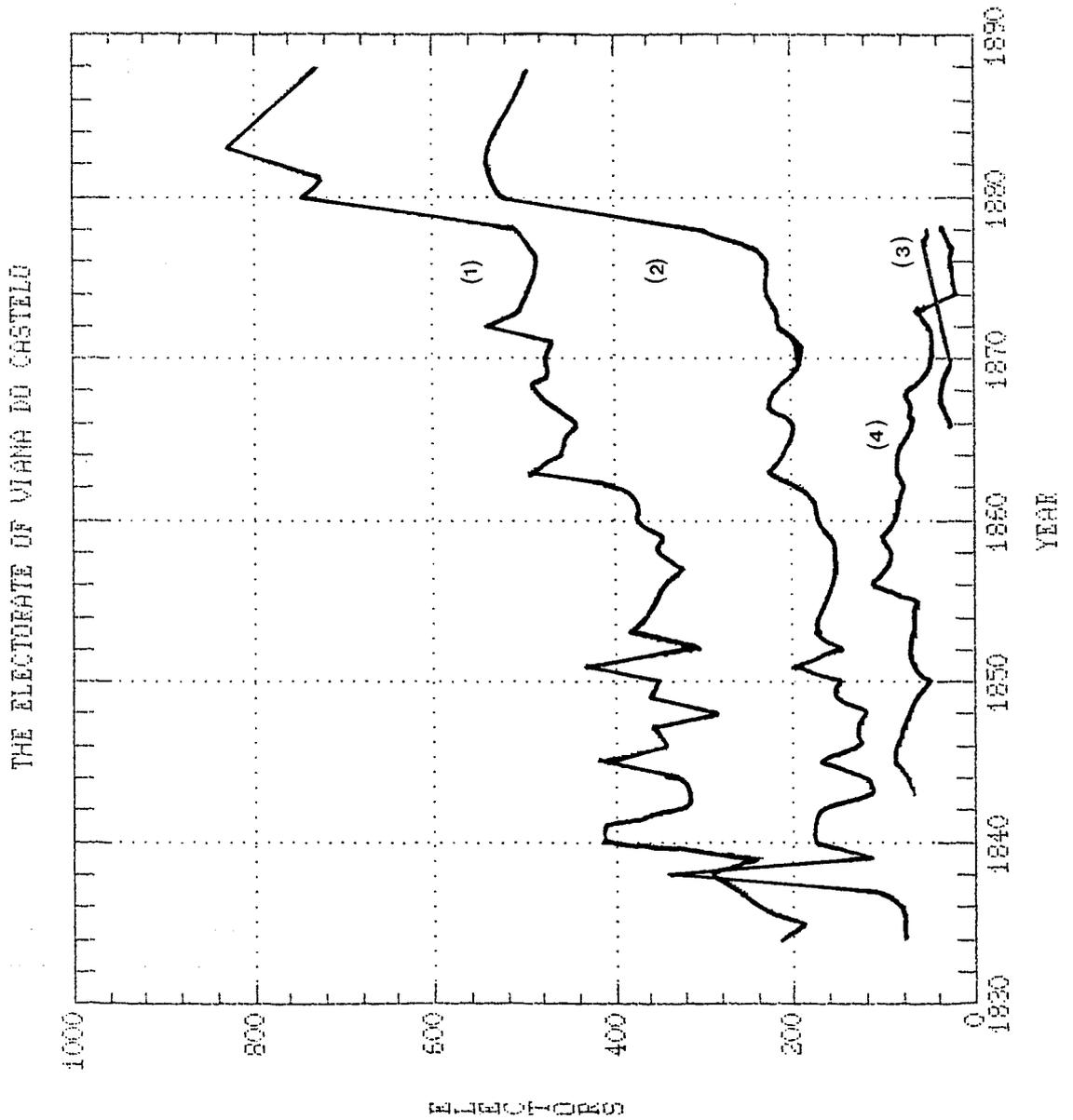
The Figure closely reflect the electoral legislation described in Section 4.3.2; years in which the franchise was substantially broadened or tightened are clearly identifiable. For example, during the politically turbulent years between 1834 and 1852, peaks mark those years in which the Septembristas governed the country[24], while troughs mark those in which the Chartistas were in power. At the same time, gradual increases caused by demographic and socioeconomic factors are traced. Several features are particularly notable. First, the extremely large Monserrate register of 1838; this was compiled under the Septembristas, and includes many military personnel (who were not listed separately). Second, broadly speaking, the electorate of Santa Maria Maior grew faster than that of Monserrate. This is likely to be associated with the greater wealth of Santa Maria Maior. Also, it may reflect the decline in maritime activities in the latter, combined with an increase in the administrative functions of the former, and the resultant intra-urban migration between the two. Third, the electorate of Monserrate grew very sharply with the electoral reforms introduced between the compilation of the 1878 and 1883 registers; this demonstrates the extent to which poorer members of the society - more of which lived in Monserrate than Santa Maria Maior - had previously been denied the right to vote.

Considering the characteristics of the electorate, Table 7.1 shows the percentages of electors with particular characteristics by decade; atypical years have effectively been smoothed by grouping the data by decade and will be considered separately below. The analysis includes all electors, whether permanent residents, employees of the customhouse, or stationed in the military garrison, but excludes records for which the information of interest is unavailable.

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[24]In 1845, one of the highest peaks of the period of political instability (1834-1852), it has been suggested that the Septembristas engineered the inclusion of nonexistent people on the registers in order to secure election victory; the infamous "electoral tyranny" of 1845 (Caldas, 1919:728).

Table 7.1 Characteristics of the Electorate (%), 1834-1931

From	1834	1850	1860	1870	1880	1891		
To	1849	1859	1869	1878	1888	1895	1911	1931
Age								
≤25	1	1	1	1	4	2	20	10
26-35	15	14	15	13	22	17	24	24
36-45	27	22	25	27	24	27	19	28
46-55	27	29	26	28	21	23	17	19
56-65	21	22	21	19	16	17	15	12
≥66	9	12	12	12	13	14	5	7
Marital Status								
Single	22	17	19	20	19	20	34	28
Married	68	72	71	72	73	73	60	67
Widowed	10	11	10	8	8	7	6	5
Occupation								
Agriculture	3	5	4	2	1	5	2	2
Fishing	0	1	1	2	2	4	3	0
Trades & Industry	23	26	21	24	29	27	25	16
Transport	5	3	4	6	6	5	3	5
Commerce	33	23	22	19	17	17	17	18
Armed Forces	2	5	11	8	4	4	16	16
Public Administration	10	12	15	20	20	20	18	25
Professions	15	10	10	9	8	6	6	6
Proprietário	9	13	11	9	11	10	5	7
Ambiguous	0	2	1	1	2	2	5	6
Total Electors	7446	5936	7329	7237	5125	2639	1538	1416

The impression given by the figures is one of stability in the demographic structure of the electorate throughout the period 1834-1878. In the 1880s, the widening of the franchise most affected the age structure of the electorate, flattening the distribution through the inclusion of younger and, albeit to a lesser extent, older males. The 1890s however, saw a slight reduction in the franchise, which appears to have most affected young males who would, in the previous decade, have been eligible to vote. Similarly, the age distributions of the electorate in 1911 and 1931 were considerably affected by modifications in electoral legislation. In 1911 all males over the age of 21 who could read and write, or were heads of households were included. In 1931 those who could not read and write were to have paid certain taxes in order to be eligible; it was this modification that probably once more excluded a fair proportion of younger males. Also, although females over the age of 21 with certain qualifications were allowed to vote in 1931, none appear on the registers of Viana.

Turning to marital status information, there are two remarkable features. First, there is a large increase in the proportion of

single males in the twentieth century; this is directly associated with the large numbers of young males included in the electoral registers of 1911, and 1931. Second, the proportion of widowed males experiences a steady reduction from 10% to 5% over the period 1834-1931. There are several possible alternative explanations for this trend. On the one hand, perhaps the most likely explanation is that the numbers of widowers in the population experienced a steady reduction as a result of decreasing maternal mortality. On the other hand however, the same trend would be observed if there had been a steady increase in remarriage rates. As a third alternative, it is even possible, though less likely, that widowers became more likely to retire from public life.

Considering occupational information, and assuming that socioeconomic differences between the categories remain fairly constant over time, three trends in the composition of the electorate over time are evident. First, those engaged in commerce and the professions, who had together been a powerful force in the early electorate, were gradually replaced between 1834 and 1878 by those engaged in public administration; the increase in the proportion engaged in public administration is largest in the 1870s, due to the inclusion of employees of the customhouse. Second, the widening of the franchise in the 1880s can be seen to have affected the electorate mainly through the inclusion of those engaged in trades & industry. Finally, with respect to members of the armed forces, the proportion of electors stationed at the military garrison increased to a peak in the 1860s, and thereafter decreased to the end of the century. Also, a comparison of age, marital status, and occupation information together reveals that the increase in the electorate on the registers of 1911 and 1931 can be attributed to the inclusion of a large number of young, single, male members of the armed forces.

Turning to birthplace information; this was only recorded on the electoral registers of 1842, 1843, 1844, and 1852. The frequencies of birthplaces for the period 1842-1844, and the year 1852 are displayed in Table 7.2. Because the mobility of military personnel is not of primary interest in this study, the data for these individuals - the military elite - has been omitted; thus, the figures are calculated only with respect to the civilian elite (members of the elite who were not military personnel).

Table 7.2 Birthplaces of the Electorate

Place	1842-1844				1852			
	No.	%	Σ%	IM%	No.	%	Σ%	IM%
Santa Maria Maior	373				172			
Monserrate	99				58			
City	790	61.5	61.5		230	51.5	51.5	
Borough	98	7.6	69.1	19.8	43	9.6	61.1	19.8
District	141	11.0	80.1	28.5	53	11.9	73.0	24.4
Braga District	123	9.6	89.7	24.8	57	12.7	85.7	26.3
Portugal	132	10.3	100.0	26.7	57	12.7	98.4	26.3
Elsewhere	1	0.0	100.0	0.2	7	1.6	100.0	3.2
Subtotal	1285	100.0		100.0	447	100.0		100.0
Unknown	74				-			
Total	1359				447			

Note: IM% is calculated for in-migrants (non-natives) alone.

During the decade 1842-1852 there was a significant increase in the number of electors born outside Viana itself, and then further afield. Considering the birthplaces of non-natives of Viana alone (IM%), it can furthermore be seen that this shift was caused by the increasing proportion of electors from within the District, but not the Borough of Viana, and the inclusion of more foreign born residents. With respect to in-migrants to Viana, since the legislation simply stipulated that individuals had to have been permanently resident for a period of about a year prior to their inclusion in the electorate, the identified shift suggests that in-migration of the electorate is likely to have increased during the decade; however, whether this increase in in-migrants came from smaller inland towns, or rural parishes, is difficult to ascertain. Considering those not born in Viana once more, it can be seen that roughly equal proportions were natives of the rest of the District of Viana, the adjacent District of Braga, and other districts of Portugal; this provides evidence of both rural-urban and longer distance migration. Finally, of all those not born in Viana (712), 71% (503) were residents of Santa Maria Maior, compared with 69% of the native electorate, suggesting that in-migrants were distributed between the two parishes in the same proportions as the native population.

It is noted that in this Section, the characteristics of those individuals recorded on the muster-rolls who were at some later point included in the electorate - the "future electorate" of the muster-rolls, are not compared with those of the rest of the male population of the Town between 1826 and 1833 because so much

information is missing from the muster-rolls that it would be difficult to draw any firm conclusions.

7.3.2 A Comparison of the Electorate with the Population

In the introduction to the Portuguese census of 1864, it was stated that there were 87 electors per 1,000 persons at the national level, this index of suffrage was then compared with figures for other European countries ranging from 262‰ in France, to 10‰ in Spain. Since this index could be quite misleading, as it was greatly affected by the sex and age structure of the population for which it is calculated (particularly if levels of mortality and male out-migration were relatively high as was the case in nineteenth century Portugal), the denominator of the index was then restricted to males over 25 years of age to give a new national figure of 380‰ . The same indices for Santa Maria Maior and Monserrate are, respectively, 428‰ and 349‰ in 1864, and 464‰ and 499‰ in 1878.

This exercise can be taken further by comparing the age and marital status composition of the electorate in 1864 and 1878 with the population from which it was drawn (approximated by the population present on the censuses)[25]. The procedure adopted assumes that the probability of inclusion in the electorate of an individual from a particular subgroup of the population can be modelled as the outcome of a Poisson process (see Section 3.3). A series of log-linear models are fitted to the data using a p-value of 5% in the likelihood ratio tests for the comparison of pairs of alternative models. The data are presented in Table 7.3, together with the maximum likelihood estimates of the probabilities assuming that no relationships between those of different age and marital status groups exist.

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[25]Feijó (1983:141), however, compares the electors of 1880 with the number of households rather than the number of adult males, on the grounds that, since income for the purposes of electoral legislation was measured in tax payments, entitlement to vote was generally restricted to one person per household. In this way, Brandão and Feijó (1984) found that of the 133 lavradores (owner farmers) in the parish of Carreço who were on the Arrolamento de Pessoas e Coisas (a register of household heads compiled for taxation purposes) in 1871, 78 were also on the electoral register of that year; thus providing an index of suffrage of 59%.

Table 7.3 Census Population (P) and Electors (E) by Age and Marital Status, 1864 and 1878

Age Group	Marital Status	Santa Maria Maior 1864 P	E	P/E	1878 P	E	P/E	Monserrate 1864 P	E	P/E	1878 P	E	P/E
16-25	Single	326	2	0.01	480	9	0.02	310*	4	0.01	175	5	0.03
	Married	21	0	0.00	56	1	0.02	27	1	0.04	44	6	0.14
	Widowed	1	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00
26-35	Single	113	23	0.20	196	33	0.17	144	15	0.10	52	13	0.25
	Married	142	39	0.27	194	66	0.34	130	18	0.14	127	36	0.28
	Widowed	5	2	0.40	5	0	0.00	1	1	1.00	4	0	0.00
36-45	Single	66	28	0.42	63	26	0.41	46	12	0.26	24	12	0.50
	Married	200	87	0.44	185	89	0.48	162	55	0.34	104	70	0.67
	Widowed	11	4	0.36	10	7	0.70	13	7	0.54	3	3	1.00
46-55	Single	44	19	0.43	53	21	0.40	27	13	0.48	16	4	0.25
	Married	181	88	0.49	161	108	0.67	131	59	0.45	116	79	0.68
	Widowed	19	4	0.21	19	7	0.37	17	2	0.12	10	4	0.40
56-65	Single	28	14	0.50	28	14	0.50	19	10	0.53	6	6	1.00
	Married	88	47	0.53	137	83	0.61	63	38	0.60	94	45	0.48
	Widowed	29	11	0.38	30	19	0.63	12	6	0.50	23	8	0.35
≥66	Single	24	4	0.17	16	10	0.63	12	0	0.00	7	3	0.43
	Married	68	24	0.35	55	40	0.73	38	24	0.63	50	27	0.54
	Widowed	47	9	0.19	42	18	0.43	20	8	0.40	27	10	0.37
Missing		53			13			25	5		11		
Total		1413	458	0.32	1730	564	0.33	1177	298	0.25	882	342	0.39

* Adjusted from 535 (following Reis, 1987:262-266), as described in Section 4.2.4.

The simplest model best fitting the data was a main-effects model including seven parameters. The final deviance was 98 on 62 degrees of freedom - a relatively poor fit to the data.

The relatively poor fit to the data is associated with interaction between parish and other effects; thus, while age, marital status, and year effects were readily incorporated in the model, parish effects were not. The reason for this be understood by comparing the 1864 and 1878 census population figures of the two parishes in Table 7.3. The out-migration of a substantial number of the younger males from Monserrate between 1864 and 1878, probably from the less-advantaged sectors of society, was responsible for an increase in the proportion of wealthier residents, and thus electors. At the same time, the large amount of in-migration of young males to Santa Maria Maior kept the proportion of wealthier males down in that parish. As described in Section 4.2.4, these groups can be identified as the same - a group of younger males, perhaps displaced from the declining maritime activities based in the parish of Monserrate, and thereby forced to search for work in the expanding administrative functions of Santa Maria Maior. However, since the primary purpose of this analysis is to identify trends by age and marital status, no further models incorporating interaction parameters were fitted and the main effects model was accepted. The parameter estimates are shown in Table 7.4.

Table 7.4 Parameter Estimates of the Electorate Model

Parameter	Estimate	Standard Error	Relative Risk
Reference Group (RG):			
Year 1864,			
Age 16-25,			
Unmarried	-4.140	0.1916	(RG)
Year 1878	0.288	0.0512	1.33
Age 26-35	2.290	0.2013	9.87
36-45	2.967	0.1992	19.43
46-65	3.102	0.1962	22.24
≥66	2.984	0.2051	19.77
Married	0.314	0.0585	1.37

Deviance: 98.3, 62 Degrees of Freedom

The main effects model indicates that there is no interaction between an individual's age group and marital status, so that the expected number of electors in a cell can be estimated by multiplying the population in that cell by the product of two factors, one the probability of being an elector in that age group, and the other for that marital status. Also, the model identifies a broadening of the franchise between 1864 and 1878 of the order of 33% across all age and marital status groups.

The estimated probabilities of inclusion in the electorate corresponding to this model are set out in Table 7.5.

Table 7.5 Estimated Probabilities of Being an Elector

Age	1864		1878	
	Unmarried	Married	Unmarried	Married
16-25	0.02	0.02	0.02	0.03
26-35	0.16	0.22	0.21	0.29
36-45	0.31	0.42	0.41	0.57
46-65	0.35	0.48	0.47	0.65
≥66	0.31	0.43	0.42	0.57

Note: The relationship between columns is simple:
  (Married) = 1.37 • (Unmarried);
  (1878)   = 1.33 • (1864).

The figures provide a very different picture from that of the crude index of 42 electors per 100 males over 25 years of age; for example, almost two-thirds of married men between the ages of 46 and 65 in 1878 were electors. Clearly, the probability increases with age as individuals accumulated the wealth necessary under the electoral legislation outlined in Section 4.3.2. There is then a decrease at older ages, for which there are two possible explanations. First, some electors may have retired from public life or simply ceased to qualify as electors. Second, excess mortality among the less-advantaged sectors of society at younger ages may have introduced a selection effect, leading to their survivors being less frail and hence more likely to have survived at older ages (Vaupel et al, 1985); this effect would reduce the proportion of electors in the population at older ages, as mortality among the electorate took its toll. Considering marital status, the probability of married men being included in the electorate in each age group is higher than that of single men; of course, this will to some extent reflect the dependence of marriage on wealth. The low probabilities of widowed

electors also have two possible explanations. First, in a society experiencing substantial levels of maternal mortality, one would expect the number of poorer widowers to have greatly exceeded the number who were wealthy. Second, at the same time, these results may partly be explained by clerks failing to have recorded an elector's widowhood and continuing to have recorded him as married.

Unfortunately, the analysis cannot be extended to include an examination of occupational participation in the electorate because the censuses of 1864 and 1878 did not include occupational information, and the census of 1890, although recording occupational function groups in four broad age groups, is not presented at the level of parish.

7.3.3 Comparison of the Elite with the Electorate

This Section seeks to identify the elite sample of the electorate in more detail. For the purposes of this Chapter, the elite have been defined as those members of the electorate with names consisting of three or more components. In Viana, 84% of electors in the period 1834-1931 were recorded on the electoral registers with names consisting of three or more components. In order to identify the elite, their characteristics are compared with those of the electorate of which they form a sample.

This is achieved by comparing the age, marital status, and occupation composition of the elite with that of the electorate over the period 1834-1931 for the two parishes of Viana. Proceeding as in Section 7.3.2, it is assumed that the probability of inclusion in the elite of an individual from a particular subgroup of the electorate can be modelled as the outcome of a Poisson process. A series of log-linear models are fitted to the data using a p-value of 5% in the likelihood ratio tests for the comparison of pairs of alternative models.

The simplest model best fitting the data is a main-effects model including twelve parameters. The final deviance is 1173 on 2680 degrees of freedom. The most powerful explanatory variable, by far, is occupation; nevertheless, all the other explanatory variables, except age, are found to be significant. The parameter estimates are shown in Table 7.6.

Table 7.6 Parameter Estimates of the Elite Electorate Model

Parameter	Estimate	Standard Error	Relative Risk
Reference Group (RG):			
Parish:			
Santa Maria Maior			
Period:			
1850-1878			
Occupation:			
Commerce			
& Armed Forces			
& Public Administration			
& Professions			
Unmarried	-0.042	0.013	(RG)
Parish:			
Monserrate	-0.029	0.012	0.97
Period:			
1834-1849	-0.059	0.017	0.94
1880-1895	-0.033	0.015	0.97
1911-1931	-0.089	0.022	0.91
Occupation:			
Agriculture			
& Transport	-0.313	0.024	0.73
Fishing	-0.828	0.056	0.44
Trades & Industry	-0.121	0.014	0.89
Proprietário	0.056	0.019	1.06
Unknown	-0.022	0.022	0.98
Marital Status:			
Married	-0.042	0.013	0.96
Unknown	-0.093	0.025	0.91

Deviance: 1173, 2680 Degrees of Freedom.

The main effects model indicates that there is no interaction between the variables: period, parish, occupation, and marital status; so, the expected number of electors with names of three or more components in a cell can be estimated by multiplying the number of electors in that cell by the product of four factors, one the probability of being recorded with three or more component names in that parish, one for that period, one for that occupation, and the other for that marital status.

Considering the interpretation of the model, it can be seen that for members of the reference group (unmarried males engaged in commerce, the armed forces, public administration or the professions; resident in the parish of Santa Maria Maior in the period 1850-1878), the proportion of electors recorded with three or more component

names is 96%. At the other extreme, for married fisherman resident in Monserrate in the early-twentieth century, the proportion of electors recorded with three or more component names is just 36%.

An examination of the odds ratios in the last column of Table 7.6, indicates that the most powerful explanatory variable, by far, is occupation. In general, while the odds ratios associated with other variables are relatively close to unity, those associated with occupation are relatively far from unity. Because the model is a main effects model, the effects of each variable can be considered separately.

First, electors resident in Monserrate were slightly less likely (0.97) as residents of Santa Maria Maior to have names consisting of three or more components. This interpretation can be inverted to suggest that electors with longer names were more likely to reside in Santa Maria Maior. This is hardly surprising, because Santa Maria Maior housed the wealthy commercial hub of Viana, while Monserrate housed the poorer fishing community.

Second, electors during the periods 1880-1895, 1834-1849, and 1911-1931, were 0.97, 0.94, and 0.91 times as likely to have names consisting of three or more components than electors during the period 1850-1878, respectively. This interpretation can also be inverted, but the inversion requires a little caution. On the one hand, it may simply reflect the conscientiousness of scribes in recording the component names of electors. On the other hand, it may suggests that the period 1850-1878 was most conservative, in that the proportion of electors with longer names was higher; in the same way the remaining periods might be described as indicating degrees of liberality. Of course, it is possible that the political effects are being confounded by a trend in the number of component names that individuals were given at birth; but, this is unlikely because age is not found to be a significant explanatory variable. Also, the periods do correspond quite closely to the political eras outlined in Section 4.3.2.

Third, married electors were slightly less likely (0.96) to have names consisting of three or more components than unmarried electors. This interpretation can be inverted to suggest that electors with longer names were more likely to remain unmarried than those with shorter names. Also, it is interesting to note that electors for whom no marital status was recorded were only 0.96 times as likely to

have names consisting of three or more components than unmarried electors. This arises because a relatively large number of electors with shorter names appear on the electoral registers of 1840, on which marital status information was not recorded.

Finally, considering the most powerful explanatory variable - occupation - electors engaged in trades & industry, agriculture & transport, and fishing, were 0.89, 0.73, and 0.44 times as likely to have names consisting of three or more components than those electors engaged in commerce, the armed forces, public administration, the professions, respectively. Again, these are reassuring results, because the occupational classification reflects socioeconomic status. The interpretations can be inverted to suggest that electors with longer names were more likely to be engaged in commerce, the armed forces, public administration, or the professions, than in trades & industry, agriculture & transport, and fishing.

Also, the odds ratio of 1.06 for the **Proprietário** occupational classification reflects the extent to which individuals who were recorded as being **Proprietários** were more likely to have longer names. This is an interesting result, because it differs significantly from that for the agriculture occupation function; it therefore suggests that the problem of individuals engaged in agriculture being falsely recorded as **Proprietários** (discussed in Section 3.5.4) is not great.

In summary then, the elite are found to be a biased sample of the electorate, weighted in favour of residents of the parish of Santa Maria Maior during the period 1850-1878, who were unmarried, and were engaged in commerce, the armed forces, public administration, the professions, or who were **Proprietários**. Considering the analyses that are performed in the rest of this Chapter, this bias is not a problem. Indeed, the bias in the sample is towards a smaller group that might be described as the "true" elite, although this true elite eludes formal definition.

7.4 Migration of the Elite

In order to identify migration among the elite of Viana, it is first necessary to establish the various circumstances under which individuals entered and left the electorate, whether temporarily or permanently. Essentially of course, inclusion in the electorate was governed entirely by electoral legislation - chiefly concerned with sex, age, and wealth, and later, literacy and household headship. Indeed, frequent changes in the legislation between 1834 and 1852 were the prime cause of fluctuations in the number of electors. Nevertheless, at the individual level, eligibility for inclusion in the electorate varied not only with the legislation, but also with individual circumstances. Entry into the electorate may have been gained through reaching the required minimum age, acquiring the necessary level of income, whether through inheritance or a personal increase in wealth; learning to read and write; or assumption of household headship. Departure from the electorate, besides being governed by changes in personal circumstances, may have arisen through out-migration or death. These criteria define the observational plan - or window - through which the electorate of Viana was monitored.

In this Section, migration of the elite is analysed through an examination of indirect, and inferential evidence of temporary and permanent absence from Viana. Of course, the analyses are dependent on the record linkage of the muster-rolls, electoral registers, passport books, and cemetery lists. References to possible inaccuracies of the record linkage are therefore discussed where appropriate. First, the retrieval of a statistical file of individual life histories from the Viana Database is described. Second, restriction of the dataset is considered in the context of the circumstances under which the original manuscript sources were created. Third, several exploratory analyses of the restricted elite are described; these provide some initial insight into the generation of individual life histories, while also serving to verify the quality of the data. Fourth, indirect evidence of migration of the elite is examined; the passport book records are used to provide estimates of emigration, stage migration, return migration and repeat migration among the elite. Finally, inferential evidence of

migration of the elite is examined; in particular, models of duration on the electoral registers are estimated.

7.4.1 Retrieval of Individual Life Histories

The focus of the analysis presented here is on entry into, and exit from the elite. In this respect, the effects of individual characteristics are to be estimated. Some of these characteristics are independent of time; for example: place of birth, and year of birth. Others however, are time dependent; for example: place of residence, marital status, occupation, and of course, age. Quite some effort is therefore required in order to extract a statistical file of individual life histories from the database. Also, it is more efficient to work with a file of life history data for statistical analysis. In this Section, the retrieval of individual life histories from the Viana Database is described in detail, focusing on the associated problems which are particular to each variable.

Age information was the least accurately recorded variable of the data available on the electoral registers. Therefore, in order to investigate the relationship between an elector's recorded age on the electoral registers, and his actual age at the time the register was drawn up, the ages recorded on the electoral registers of the electors for whom year of birth was available from an earlier muster-roll record were examined. The results of the analysis are presented in Table 7.7.

Table 7.7 The Relationship Between Actual Age and
Age Recorded on the Electoral Registers

(1)	(2)	(3)	(4)	(5)	(6)
26-35	176	31.7	35.0	3.3	6.4
36-45	588	41.3	43.2	1.9	5.5
46-55	913	50.6	52.7	2.1	5.6
56-65	891	60.4	62.9	2.5	6.2
66-75	539	69.8	71.7	1.9	6.2
76-85	120	78.7	79.4	0.7	5.8
86-95	20	90.0	79.6	-10.4	9.8
≥96	10	97.7	83.3	-14.4	4.1

Key: (1) Recorded age on the electoral registers,

(2) Number of observations in this age group,

(3) Mean recorded age,

(4) Mean actual age,

(5) Mean age discrepancy (actual-recorded)

(6) Standard deviation about (4).

Three features are particularly notable. First, the mean recorded ages do not usually fall at the mean of the age intervals. This is due to selection effects among the electorate; for example, at the higher ages the probability of death is greater towards the upper limit of an age interval, thereby weighting the electorate towards the lower limit of the interval. Second, the difference between mean actual age and mean recorded age (mean age discrepancy) appears to vary between age intervals: at the younger ages, mean recorded age is about three years lower than mean actual age; at the middle ages, mean recorded age is usually about two years less than actual age; and at the older ages, mean recorded age significantly exceeds mean actual age. Third, apart from in the age interval 86-95, the standard deviations of age discrepancy within each interval do not vary much - they are all about 6. It is interesting to note therefore that, while there is a correlation between recorded age and mean age discrepancy, there is little evidence to suggest that a correlation also exists between recorded age and the standard deviation of age discrepancy.

There are two possible explanations for the features outlined. On the one hand, the variation in mean age discrepancy between groups could be a true reflection of the relationship between actual age and recorded age. On the other hand, the features could be spurious, arising through false record linkage, or even through errors in transcription between the manuscript sources and the database. Under

these circumstances, it is important to scrutinise the record linkage and data of the individuals included in this analysis.

Close examination of the records of the individuals included in this analysis reveals that the features identified are not a spurious result of false record linkage. At the younger ages, the bias is partly due to the fact that ages recorded on the muster-rolls (which were compiled during the period 1826-1833) were assumed to have been recorded in the mid-period year 1830, whereas it is likely that, on average, they may have been recorded earlier than 1830. Also, in a couple of cases with lower recorded ages, it is possible that individuals who became fathers at young ages may have been linked together with their sons, thus increasing the mean age discrepancy a little. At the older ages, the results are based on little data, and are heavily weighted towards the recorded ages of two particular individuals. There is no evidence of false linkage, but the recorded ages of these individuals do increase rather suddenly. Because these increases occur in the early 1870s, one might postulate that an error introduced by the scribe, or by the individual himself may have been transmitted from year to year through the updating previous electoral registers. Also, at the middle ages, several instances were discovered where recorded age was inaccurately transcribed from the electoral registers to the computer. These instances were normally the result of visual errors; for example, a failure to distinguish correctly between an age in the 30s and one in the 50s.

In conclusion, it may be reasonable to increase the recorded ages of individuals by two years in order to estimate their actual age. This is consistent with the fact that the electoral registers were normally compiled some time before the year in which they were used. Further, when the older ages are taken into consideration, it is clear that recorded age generally exceeds actual age. However, it would not be reasonable to assume a mean age discrepancy of minus thirteen years, say, because of the low volume of data at these ages. As a compromise, it may be reasonable to decrease recorded ages above 75 years by eight years in order to estimate actual age.

In extracting the data, where year of birth is not available from a muster-roll record, ages recorded on the electoral registers are used by the retrieval program to calculate an estimated year of birth. The estimated year of birth is calculated by adjusting the age recorded on the electoral registers, and then taking the

arithmetic mean of the years of birth implicit in these adjusted ages. Ages are adjusted by adding two years; then, if the adjusted age exceeds 77 years, it is further adjusted by subtracting ten years to achieve a net deduction of eight years. To illustrate the algorithm, an indivdiual appearing with recorded ages a_1, a_2, ..., a_k, and corresponding adjusted ages of a'_1, a'_2, ..., a'_k, in the years y_1, y_2, ..., y_k, will have an estimated mean year of birth $e\hat{y}b$ of:

$$e\hat{y}b = \sum_{i=1}^{k} (y_i - a'_i) / k$$

Categorical data - such as marital status, occupation function, and occupation sector - are analysed over time by the retrieval program in order to identify periods spent in different categories. In general, an initial category is identified, followed by a limited number of subsequent categories together with the associated periods of membership of these categories. Depending on the nature of the information, transitions between categories sometimes have to satisfy certain rules. For example, an individual could not become single again once he had been married; he could however become widowed, or (by the end of the period 1826-1931) divorced.

Marital status information is analysed by the retrieval program as follows. First, sequences of identical marital statuses are collected, together with the lengths (or weights) of each sequence. For example, the sequence 1,6,1,7,1,2,6,2,7,7,7,7,7,7,8,8,3,2,2 would initially be summarised as 1(3),7(1),1(1),2(1),6(1),2(7),3(3),2(2). Then, the algorithm identifies the initial marital status of the individual. This is taken to be single if at any point in the sequence the cumulative weight of single marital statuses exceeds the cumulative weight of married and widowed statuses. Thus, in the example, the individual's initial marital status is identified as single. Finally, the algorithm divides the remaining sequence into periods spent in different states, subject to a maximum of four. In the example, the algorithm discards the less certain 6, to end up with the marital statuses 1(5),2(9),3(3),2(2).

Occupational information is analysed by the retrieval program somewhat differently from marital status information because transitions between occupation function categories and between

occupation sector categories do not have to satisfy any particular rules. First however, as in the analysis of marital status information, sequences of identical occupation function codes and identical occupation sector codes are collected, together with the lengths (or weights) of each sequence. Then, the algorithm identifies the three occupation function codes and three occupation sector codes with the highest total weights. The period of observation of the individual is divided amongst the three occupation function codes and three occupation sector codes, ensuring that the temporal ordering of periods with these codes is consistent with that of the initial sequence of codes.

The analysis of occupation described above was extended to provide indicators concerning two particular occupations. First, because the category **Proprietário** is known to be a little problematic[26], an extra variable was introduced which simply indicated whether or not a particular individual had ever been recorded as being a **Proprietário**. Second, a similar variable was introduced to indicate whether or not a particular individual had ever been recorded as being a member of the clergy.

Parish of residence information is analysed quite simply. The initial parish of residence is taken to be the first encountered. Changes of residence between the two parishes of Viana are taken as they occur over time, subject to a maximum of two.

The contents of the statistical file of life history data are described in detail in Appendix 7.B.

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[26] The occupation **Proprietário** was introduced during the second quarter of the nineteenth century, and literally meant someone whose livelihood was derived from the rent collected on property which he owned. However, the status it implicitly carried ensured its growth in popularity beyond its original meaning. Thus, although the 1890 census enumerators were trained to ask probing questions in order to classify members of the population correctly (Recenseamento da População, 1890:XX-XXI), those drawing up other documents were less careful, generating pseudo **Proprietários** on these other documents. Other manuscript sources from Viana suggest that some of these pseudo **Proprietários** were engaged in agriculture.

7.4.2 Restriction of the Dataset

The analysis of the statistical file of life history data must be considered in the context of the circumstances under which the original manuscript sources were created. The statistical file of life history data contains information on 6,173 identified members of the elite. For the purposes of this Chapter, the elite is defined as those individuals with names consisting of three or more components who appear at least once on the electoral registers. However, for the purposes of the statistical analysis presented in this Section, the criteria determining membership of the dataset are restricted further.

Only members of the elite who appeared on electoral registers compiled before 1880 are considered; thus, only 3,128 of the 6,173 cases are considered. There are two associated reasons for this. First, there was a large broadening of the electorate in the 1880s, followed by a restriction of the franchise in the 1890s; thus, a large number of members of the elite only appear on the electoral registers of the 1880s. Second, the passport books only cover the period 1835-1896, and the cemetery lists only cover the period 1855-1922, while the electoral registers cover the period 1834-1931; thus, nothing is known about emigration of the elite following 1896, and nothing is known about mortality of the elite following 1922. By restricting membership of the dataset to members of the elite who first appeared on an electoral register compiled before 1880, analyses will be performed on a well defined group with few right-censored life histories (most of the members of this restricted dataset can reasonably be expected to have died by the year 1922).

In the following statistical analyses of individual life histories, the term elite may be taken to refer to the restricted elite described in this Section, unless otherwise indicated.

7.4.3 Exploratory Analyses

In order to gain some insight into the 3,128 life histories of the restricted dataset, a number of exploratory analyses are performed in this Section. First, frequencies of modes of entry into, and exit from the elite are presented in Table 7.8. For each mode of exit, the year of exit is classified into one of the three periods 1834-1855, 1856-1922, and 1923-1931, which roughly correspond to the periods before, during, and after information from the cemetery lists is available.

Table 7.8 Modes of Entry Into, and Exit From the Elite

Mode of Entry	Mode of Exit	Period of Exit 1834 1855	1856 1922	1923 1931	Total
Muster-Rolls	Electoral Registers	264	62	-	326
	Passport Books	3	2	-	5
	Cemetery Lists	2	170	-	172
Electoral Registers	Electoral Registers	691	1118	3	1812
	Passport Books	4	15	-	19
	Cemetery Lists	2	704	-	706
Passport Books	Electoral Registers	9	25	1	35
	Passport Books	-	-	-	-
	Cemetery Lists	-	53	-	53

The figures are quite revealing, providing some insight into the interaction between the different modes of entry into, and particularly exit from the elite. For example, considering the 503 members of the elite who first appeared on the muster-rolls, only 172 finally appeared on the cemetery lists; the mean estimated age at death for these individuals is 75 years. Of the 326 whose modes of exit were the electoral registers, 264 last appeared in the period 1834-1855, with a mean estimated age at exit of 57 years; and 62 last appeared in the period 1855-1922, with a mean estimated age at exit of 71 years. On the one hand, this suggests that a substantial number of the 264 who last appeared in the period 1834-1855 were out-migrants, because their mean estimated age at exit is much lower than the mean estimated age at death. On the other hand however, considering the 62 who last appeared in the period 1855-1922, it is difficult to explain the high mean estimated age at exit of 71 years. Nevertheless, it is possible that some of these individuals were out-migrants, because the mean age at exit for those leaving the

elite following an entry in the passport books is also relatively high - 56 years.

Considering the 2,536 members of the elite whose modes of entry were the electoral register, only 706 finally appeared on the cemetery lists, with a mean estimated age at death of 67 years. Of the 1,812 whose modes of exit were the electoral registers, 691 last appeared in the period 1834-1855, with a mean estimated age at exit of 49 years; and 1,118 last appeared in the period 1855-1922, with a mean estimated age at exit of 51 years. Again, these figures suggest that a substantial number of the 691 who last appeared in the period 1834-1855 were out-migrants, and that a substantial number of the 1,118 who last appeared in the period 1856-1922 were also out-migrants, because in this instance both the mean estimated ages at exit are much lower than the mean estimated age at death.

Considering the members of the elite whose modes of entry were the passport books, the figures identify 88 likely return migrants; thus, a crude initial estimate of the proportion of the elite that were return migrants is almost 3%. Also, the figures identify a total of 24 emigrants who do not return - members of the elite whose modes of exit were the passport books.

Finally, the penultimate column of Table 8.2 indicates that only 4 members of the elite last appeared on the electoral register of 1931, all the other 3,124 members of the elite had exited from the elite before that time, either through death, out-migration, or merely lapse of membership. A further 70 members of the elite last appeared on the electoral registers of 1911, and did not appear on the cemetery lists; these individuals exited from the elite before 1931, either through death in the period 1923-1931; or through out-migration or lapse during the period 1911-1931.

The second exploratory analysis examines the years in which members of the elite first and last appeared on the electoral registers, and the numbers of appearances on the electoral registers. The numbers of appearances on the electoral registers are presented in Table 7.9.

Table 7.9 Numbers of Appearances on the Electoral Registers

Appearances	Frequency	%	Σ
1	901	28.8	28.8
2	350	11.2	40.0
3- 5	515	16.5	56.5
6-10	448	14.3	70.8
11-20	474	15.2	86.0
11-30	279	8.9	94.9
31-54	161	5.1	100.0
Total	3128	100.0	

The figures reveal a particularly remarkable feature of the elite - almost 29% of the elite appeared on just one electoral register. An immediate explanation for this would be that members of the elite appearing on just one electoral register were at the margin of the franchise, and were included on the larger registers compiled after progressive changes in electoral legislation. However, there are two associated arguments against this. First, although progressive legislation was sometimes quite closely followed by regressive legislation, this was not often the case. It is therefore difficult to explain why these members of the elite did not appear on more than just one electoral register. Second, even if members of the elite at the margin of the franchise who had been included on an electoral register for the first time were often likely to be excluded from the following register, it remains difficult to explain why these members did not reappear on the registers later - perhaps when the franchise was broadened again. Therefore, it is likely that the high proportion of members of the elite who appeared on just one electoral register reflects high levels of mobility. Of course, there are likely to have been large differentials between the levels of mobility of different sub-groups of the elite; for example, many of the 102 members of the elite who appeared only on the electoral register of 1838 are likely to have been military personnel, although they were not explicitly recorded as such.

In order to examine this issue further, the numbers of members of the elite appearing for the first time, the last time, or the only time in each year are presented in Table 7.10. The numbers of members of the elite appearing for the first time in each year are also depicted in Figure 7.2.

Table 7.10 Members of the Elite Appearing on the Electoral Registers For the First Time (1), Last Time (2), or Only Time (3)

Year	(1)	(2)	(3)	(3)/(1)	(1)-(3)	(2)-(3)
1834	234	12	12	0.05	222	0
1835	40	24	10	0.25	30	14
1836	98	34	20	0.20	78	14
1837	98	40	23	0.23	75	17
1838	175	102	74	0.42	101	28
1839	33	45	11	0.33	22	34
1840	139	16	14	0.10	125	2
1841	18	82	15	0.83	3	67
1842	86	58	31	0.36	55	27
1843	66	26	13	0.20	53	13
1844	54	28	11	0.20	43	17
1845	114	122	64	0.56	50	58
1846	37	27	8	0.22	29	19
1847	26	68	12	0.46	14	56
1848	46	20	17	0.37	29	3
1849	85	48	29	0.34	56	19
1850	59	84	39	0.66	20	45
1851	146	77	44	0.30	102	33
1852	40	34	14	0.35	26	20
1853	36	51	10	0.28	26	41
1854	18	21	0	0.00	18	21
1855	15	54	10	0.67	5	44
1856	99	52	27	0.27	72	25
1857	29	31	10	0.34	19	21
1858	62	51	28	0.45	34	23
1859	33	58	10	0.30	23	48
1860	86	43	13	0.15	73	30
1861	28	45	6	0.21	22	39
1862	57	58	15	0.26	42	43
1863	140	53	19	0.14	121	34
1864	27	60	11	0.41	16	49
1865	32	73	10	0.31	22	63
1866	81	43	12	0.15	69	31
1867	85	24	3	0.04	82	21
1868	71	94	39	0.55	32	55
1869	23	33	8	0.35	15	25
1870	37	58	11	0.30	26	47
1871	98	104	64	0.65	34	40
1872	131	42	15	0.11	116	27
1873	48	90	32	0.67	16	58
1874	54	35	8	0.15	46	27
1875	26	40	6	0.23	20	34
1876	55	67	24	0.44	31	43
1877	59	57	17	0.29	42	40
1878	104	154	32	0.31	72	122
1880	(401)	24	(68)	(0.17)		
1881	(45)	49	(16)	(0.36)		
1883	(191)	165	(86)	(0.45)		
1888	(204)	66	(56)	(0.27)		
1891	(182)	102	(88)	(0.48)		
1894	(83)	68	(50)	(0.60)		
1895	(122)	142	(90)	(0.74)		
1911	(925)	70	(741)	(0.80)		
1931	(892)	4	(892)	(1.00)		

Note: Figures in brackets refer to members of the elite appearing on the electoral registers for the first time after 1878.

Figure 7.2 Members of the Elite Appearing on the
Electoral Registers for the First Time
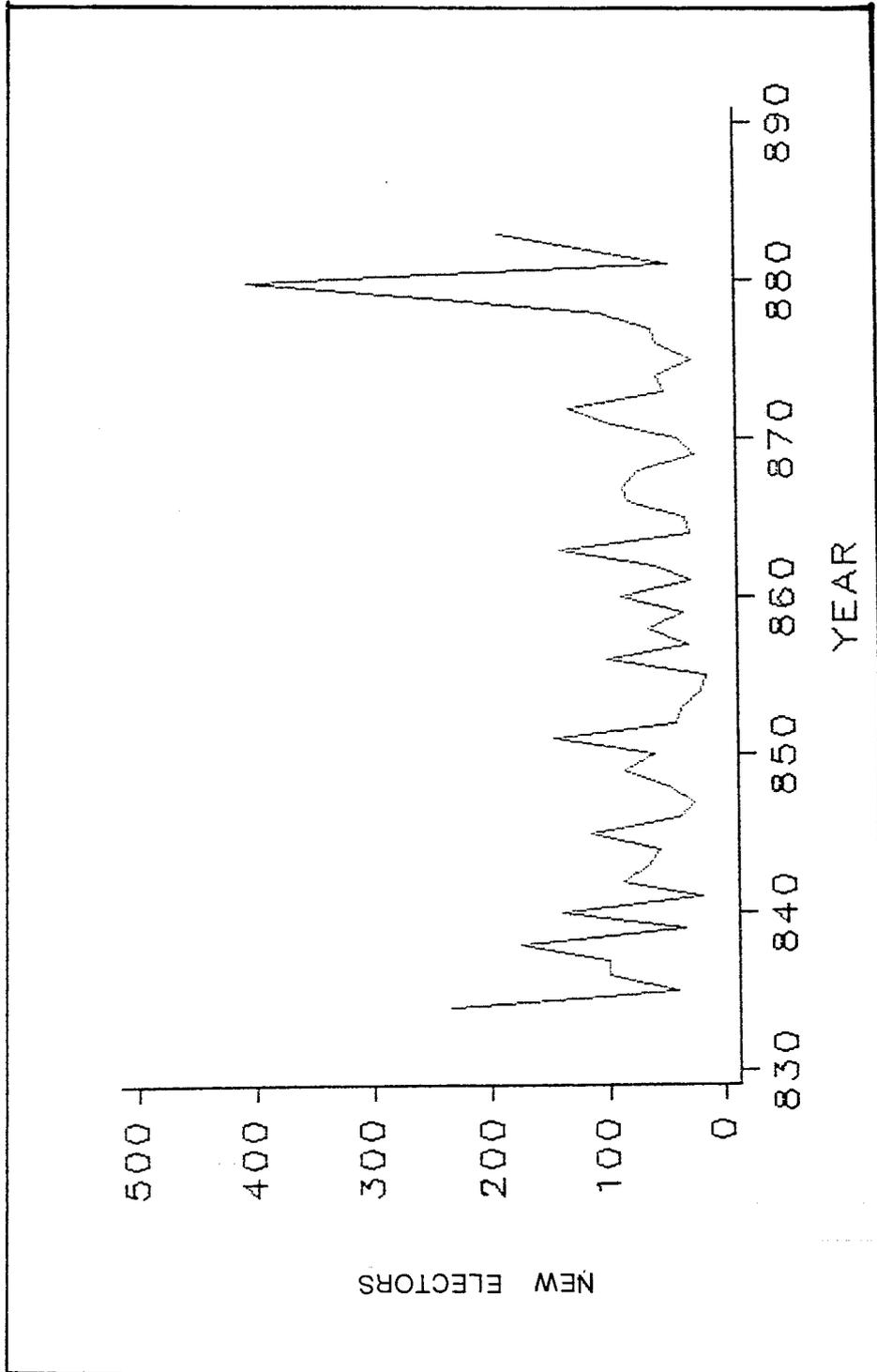
The figures indicate that although there were relatively few changes in the characteristics of the elite over the period 1834-1931 (see Section 7.3.1), there were significant annual fluctuations in the numbers appearing on the electoral registers for the first time. In general, the figures are consistent with the changes in electoral legislation outlined in Section 4.3.2. Of course, in 1834, the year in which the first electoral register was compiled, all the 234 electors were appearing for the first time. Between 1834 and 1878, the years in which the numbers of electors appearing for the first time exceeded 100 are 1838, 1839, 1845, 1851, and 1862. Of these, the first four (1838, 1839, 1845, and 1851) coincide with the peaks in the size of the electorate discussed in Section 7.3 (years in which the Septembristas came to power); however, there is no immediate explanation for the increase in 1862. In 1878, 1880, and 1883, during the extensive broadening of the electorate, 104 (11%), 401 (32%), and 191 (14%) electors were appearing for the first time, respectively. After 1883, the numbers of electors appearing for the first time is often relatively large because the time interval since the preceding register was compiled exceeds one year.

Considering the numbers appearing on the electoral registers for the last time, the figures correspond less closely with the changes in electoral legislation outlined in Section 4.3.2. For example, there is little illustration of the effects of the regressive legislation of 1836 or 1842. However, some of the larger figures do have explanations; many occur in years in which large numbers of members of the elite appeared on only one electoral register. The figure for 1838 (102) is likely to be associated with the large electoral register compiled for Monserrate, which may have included military personnel stationed in the garrison. The figure for 1845 (122) is likely to be associated with the political instability of that period; it has been suggested that in 1845 the Septembristas engineered the inclusion of nonexistent people on the registers in order to secure election victory - the infamous "electoral tyranny" of 1845 (Caldas, 1919:728). The figure for 1871 (104) has no immediate explanation, other than the fact that 64 members of the elite appeared on the electoral register of 1871 alone. The figure for 1878 (154) is likely to be partly explained by the fact that no electoral register is available for 1879; so some of these members of

the elite may otherwise have appeared again on a register compiled in 1879[27].

To complete the second exploratory analysis, it is necessary to compare members of the elite who appeared on just one electoral register with those members who appeared on more than one register. A comparison of members of the elite appearing on just one electoral register with those appearing on more than one register is presented in Table 7.11.

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[27]It is noted that the figure for 1878 cannot be explained by the fact that employees of the customhouse in Santa Maria Maior, and those stationed in the military garrison in Monserrate were no longer explicitly listed in the registers after that year. These members of the elite did continue to be included on the registers of the two respective parishes. Of the 154 members of the elite appearing for the last time in 1878, 62 were listed as residents of Santa Maria Maior, 48 as residents of Monserrate, 27 as employees of the customhouse in Santa Maria Maior (out of a total of 51 employees of the customhouse), and 17 as stationed in the military garrison in Monserrate (out of a total of 35 stationed in the military garrison). Thus, only about half the members of the elite who were employees of the customhouse or were stationed in the military garrison, and who were listed on the electoral register of 1878, last appeared on that register.

Table 7.11 Comparison of Members of the Elite Appearing on
Just One Electoral Register (1) with Those
Appearing on More than One Register (2)

Characteristic	(1)%	(2)%
Four or more component names	29	36
Appearances on other Documents		
Muster-Roll Appearance(s)	9	19
Passport Book Appearance(s)	2	6
Cemetery List Appearance	7	39
First Appearance on Electoral Registers		
Resident of Santa Maria Maior	35	56
Employee of the Customhouse	3	2
Resident of Monserrate	44	31
Stationed in the Military Garrison	18	12
Age		
Unknown	22	3
Known	78	97
Estimated Age at First Appearance (Known)		
≤25	4	6
26-35	23	33
36-45	25	28
46-55	21	19
56-65	17	10
≥66	10	4
Mean Estimated Age (Known)		
≤25	4	1
26-35	23	13
36-45	25	24
46-55	21	31
56-65	17	21
≥66	10	10
Marital Status		
Unknown	26	4
Known	74	96
Single	31	33
Married	62	62
Widowed	7	5
Occupation Function		
Unknown	30	9
Known	70	91
Agriculture	3	3
Fishing	2	1
Trades & Industry	18	25
Transport	5	4
Commerce	11	19
Armed Forces	24	13
Public Administration	25	23
Professions	12	12
Special Occupations		
Proprietário	10	24
Clergy	4	4
Number of Members of the Elite	901	2227

It can be seen from Table 7.11 that information on members of the elite who appeared on just one electoral register is far more often unavailable than for those who appeared on more than one register. To some extent this is due to the fact that 108 (12%) of the 901 members of the elite who appeared on just one electoral register appeared on the registers of 1837, 1838, or 1839, on which only names were recorded. However, often information is missing for far more than 12% of the members of the elite who appeared on just one electoral register. Therefore, information was less likely to be recorded for members of the elite who appeared on few registers. This is likely to introduce some bias into the analysis, because it is unlikely that those for whom information is missing had identical distributions of characteristics to those for whom information is available; however, for the purposes of the analysis, it is necessary to assume that the effects of any bias are minimal.

The figures suggest that members of the elite appearing on just one electoral register were more mobile than those who appeared on more than one register, because they are far less likely to have appeared on the cemetery lists. On the other hand however, they are also less likely to have appeared in the passport books. Therefore, it is likely that members of the elite appearing on just one electoral register were more likely to out-migrate from Viana, but they were more likely to out-migrate to destinations within the country than to emigrate from Portugal. Also, members of the elite appearing on just one electoral register were more likely to have names consisting of less than three components; and were more likely to be resident in Monserrate, be employees of the customhouse, or be stationed in the military garrison, than be resident in Santa Maria Maior. Considering the estimated ages[28], members of the elite appearing on just one electoral register were more likely to be older when they first appeared on the registers, but were, on average, likely to be younger than those appearing on more than one register. One might therefore speculate that members of the elite appearing on just one electoral register may also have been more likely to have

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[28] The mean estimated ages in Table 7.11 have been calculated as the simple mean of estimated age at first appearance on the electoral registers and estimated age at last appearance on the registers.

been in-migrants to Viana; however insufficient birthplace information is available to verify this. Considering marital status[29], it is perhaps surprising that members of the elite appearing on just one electoral register were not more likely to be unmarried than those who appeared on more than one register. Finally, attention is turned to occupation function and occupation sector information. Members of the elite appearing on just one electoral register were more likely to be members of the armed forces or employed in public administration than those who appeared on more than one register; Of course, this is associated with the fact that they were more likely to be stationed in the military garrison, or be employees of the customhouse. In order to draw comparisons among the remaining occupation functions, the analysis is modified by controlling for these categories. If these two occupation function categories are removed, then members of the elite appearing on just one electoral register were more likely to be engaged in fishing (4% versus 1%) or transport (10% versus 6%), and less likely to be engaged in trades & industry (34% versus 39%) or commerce (21% versus 30%). Also, only 10% of members of the elite appearing on just one electoral register were ever recorded as being a **Proprietário**, while the figure for those who appeared on more than one register is 24%. In conclusion, it is unlikely that members of the elite appeared on just one electoral register only because they were at the margin of the franchise; it is suggested that their level of mobility may have been a more important factor.

The third exploratory analysis examines evidence of mortality levels among members of the elite. In order to do this, a life table is constructed using the mean estimated ages at death of the 1,338 members of the elite who appear on the cemetery lists. These mean estimated ages at death are shown in Table 7.12, together with two indicators of the level of mortality among members of the elite calculated therefrom: (1) the probability of survival to a particular age; and (2) the probability of death at a particular age, conditional upon survival to that age. The two indicators of the level of mortality among members of the elite are also depicted in

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[29] In the calculation of the figures in Table 7.11, only the first recorded marital status, occupation function, and occupation sector were used.

Figure 7.3. It is noted that since these measures are calculated from the mean estimated ages at death of observed members of the elite, they are left-truncated; i.e. the ages at death of prospective members of the elite who died before they actually appeared on any electoral registers are not available.

Table 7.12 Measures of Mortality Levels Among Members of the Elite

MEAD	Deaths	(1)	(2)	MEAD	Deaths	(1)	(2)
26	1	0.9993	0.0007	66	39	0.5000	0.0552
27	5	0.9955	0.0037	67	33	0.4753	0.0494
28	6	0.9910	0.0045	68	35	0.4491	0.0551
29	7	0.9858	0.0053	69	28	0.4281	0.0467
30	4	0.9828	0.0030	70	40	0.3982	0.0699
31	6	0.9783	0.0046	71	37	0.3705	0.0695
32	3	0.9760	0.0023	72	41	0.3398	0.0828
33	10	0.9686	0.0077	73	31	0.3166	0.0683
34	10	0.9611	0.0077	74	37	0.2889	0.0875
35	9	0.9543	0.0070	75	33	0.2642	0.0855
36	10	0.9469	0.0078	76	22	0.2478	0.0623
37	7	0.9416	0.0055	77	29	0.2260	0.0876
38	6	0.9371	0.0048	78	26	0.2066	0.0861
39	6	0.9326	0.0048	79	30	0.1841	0.1087
40	5	0.9289	0.0040	80	33	0.1594	0.1341
41	14	0.9184	0.0113	81	36	0.1325	0.1690
42	14	0.9079	0.0114	82	22	0.1160	0.1243
43	14	0.8975	0.0115	83	20	0.1010	0.1290
44	15	0.8862	0.0125	84	21	0.0853	0.1556
45	11	0.8780	0.0093	85	29	0.0636	0.2544
46	18	0.8645	0.0153	86	16	0.0516	0.1882
47	14	0.8540	0.0121	87	15	0.0404	0.2174
48	14	0.8436	0.0123	88	9	0.0337	0.1667
49	13	0.8338	0.0115	89	12	0.0247	0.2667
50	14	0.8234	0.0126	90	7	0.0195	0.2121
51	10	0.8159	0.0091	91	8	0.0135	0.3077
52	14	0.8054	0.0128	92	3	0.0112	0.1667
53	21	0.7897	0.0195	93	4	0.0082	0.2667
54	16	0.7777	0.0152	94	3	0.0060	0.2727
55	18	0.7642	0.0173	95	1	0.0052	0.1250
56	38	0.7358	0.0372	96	2	0.0037	0.2857
57	26	0.7163	0.0264	97	1	0.0030	0.2000
58	30	0.6939	0.0313	99	1	0.0022	0.2500
59	33	0.6692	0.0356	102	1	0.0015	0.3333
60	27	0.6490	0.0302	104	1	0.0007	0.5000
61	22	0.6325	0.0254	110	1	0.0000	1.0000
62	30	0.6100	0.0355				
63	38	0.5816	0.0466				
64	32	0.5576	0.0412				
65	38	0.5292	0.0510				

Key: MEAD - Mean Estimated Age at Death
   (1) The probability of survival to a particular age.
   (2) The probability of death at a particular age, conditional upon survival to that age.

Figure 7.3 Mortality Levels Among Members of the Elite
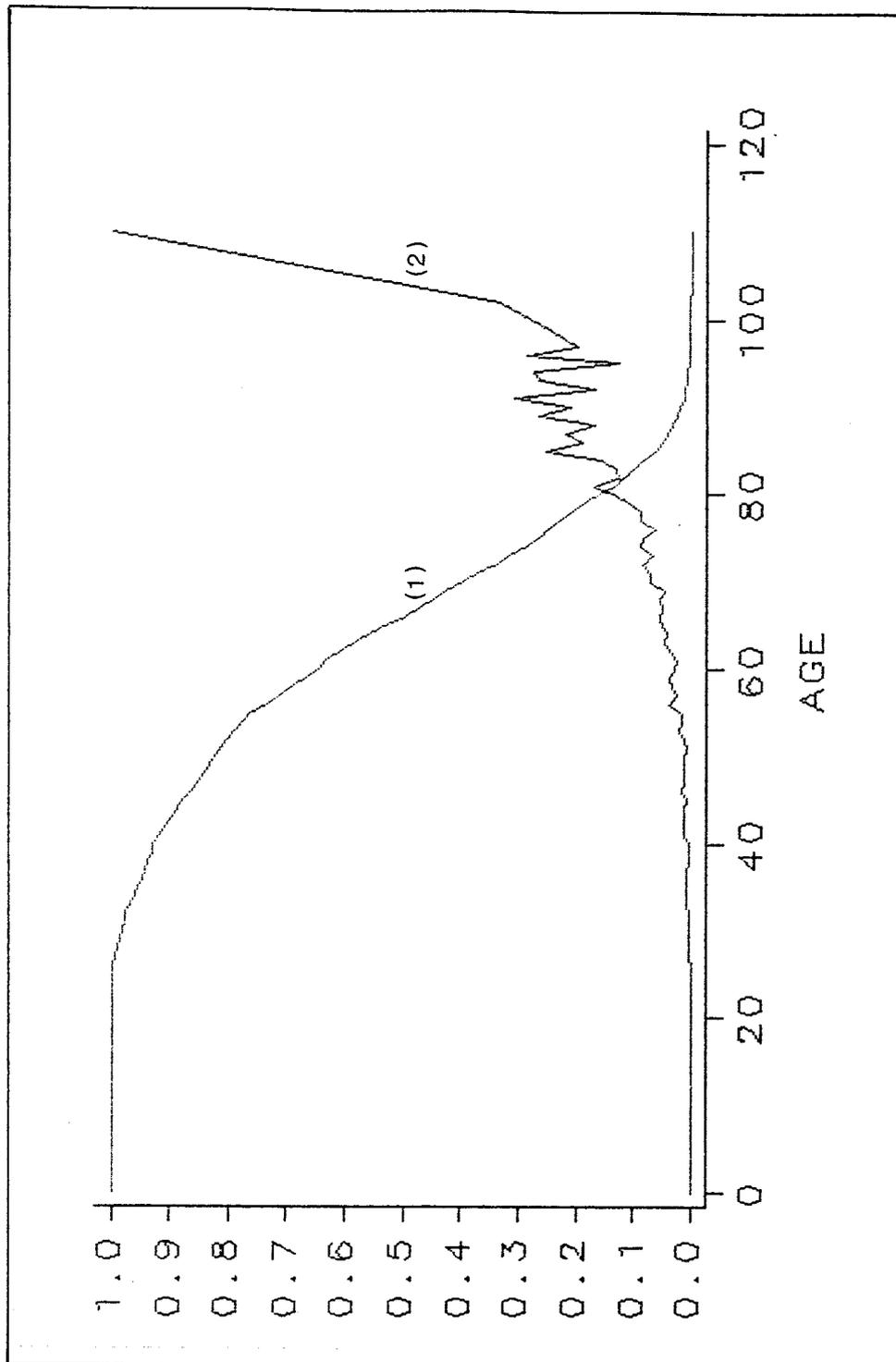
Key: (1) The probability of survival to a particular age.

(2) The probability of death at a particular age,
conditional upon survival to that age.

The figures indicate a steady increase in the probability of death up to age 80. Thereafter, the estimated probabilities of death become erratic because of the small number of remaining lives. In fact, the number of estimated ages at death exceeding 80 years suggests that, at least for those members of the elite who lived to the older ages, some bias remains in the estimated years of birth. The variations above age 80 are smoothed out in the estimated probabilities of survival from age 25 to a particular age, because the number of lives appearing in the denominator of this estimate does not decrease. It is difficult to determine whether the results are reasonable because they are conditional on survival to age 25; nevertheless, they yield an estimated expectation of life at age 25 of another 40 years, which may not be unreasonable.

7.4.4 Indirect Evidence of Migration

Indirect evidence of migration of the elite is available from the passport books; members of the elite with at least one passport book record are likely to have been emigrants, return migrants, or repeat migrants. Of course, sometimes when a passport was issued, the holder may subsequently have failed to travel, but the fact that very few individuals were issued with two passports in very close succession suggests that this was rare.

For the purposes of the analysis presented in this Section, individuals with at least one passport book record are referred to as emigrants, individuals with a passport book record and subsequent electoral register records or a subsequent cemetery list record are referred to as return migrants, and individuals with more than one passport book record are referred to as repeat migrants; also, individuals with at least one passport book record who were non-natives of Viana are referred to as stage migrants. Again, some uncertainty remains about the classification of individuals, because unless an individual life history terminates with a cemetery list record, the possibility remains that that individual may have migrated from Viana, returned to Viana, migrated from Viana again, etc.; i.e., some of the individual life histories are right-censored.

Four analyses are presented. First, emigration is identified through a comparison of members of the elite with at least one

passport book record with those with no passport book record; i.e., a comparison of emigrant members of the elite with non-emigrants. In the remainder of this Section, three components of migration are explored in more detail: stage migration, return migration, and repeat migration.

7.4.4.1 Emigration

The first analysis presented in this Section is a comparison of members of the elite with at least one passport book record with those with no passport book record; i.e., a comparison of emigrant members of the elite with non-emigrants.

Table 7.13 Comparison of Members of the Elite With
No Passport Record with Those With
At Least One Passport Record

Characteristic	Passport Records 0(%)	Passport Records ≥1(%)
Four or more component names	33	44
Appearances on other Documents		
Muster-Roll Appearance(s)	16	12
Cemetery List Appearance	29	51
First Appearance on Electoral Registers		
Resident of Santa Maria Maior	49	59
Employee of the Customhouse	2	1
Resident of Monserrate	35	36
Stationed in the Military Garrison	14	4
Birthplace		
Unknown	56	3
Known	44	97
Santa Maria Maior	26	26
Monserrate	14	17
Viana (Town/City)	47	70
Viana (Borough)	9	5
Viana (District)	17	11
Braga District	13	8
Elsewhere in Portugal	13	5
Elsewhere	1	1
Marital Status		
Unknown	11	-
Known	89	100
Single	31	58
Married	63	38
Widowed	6	4
Occupation Function		
Unknown	15	13
Known	85	87
Agriculture	3	3
Fishing	1	-
Trades & Industry	23	33
Transport	4	7
Commerce	17	30
Armed Forces	16	4
Public Administration	24	13
Professions	12	10
Special Occupations		
Proprietário	20	35
Clergy	4	1
Number of Members of the Elite	2978	150

The figures are broadly consistent with the results of the analyses presented in Section 6.3; these found that residents of Monserrate were less likely to emigrate (at least, with passports); that those issued with passports were more likely to be single; and that there was a significant amount of stage migration, mainly from Viana's immediate hinterland, but with some from further afield.

Also, the analyses of Section 6.3 suggested that emigrants were more likely to be drawn from the wealthier sectors of Viana.

Indeed, since those issued with passports are more likely to have had names consisting of four or more components, are more likely to have been residents of Santa Maria Maior, and are more likely to have ever had their occupation recorded as **Proprietário**, it is suggested that even among the elite, emigrants were still more likely to be drawn from the wealthier sectors of society. Further, those issued with passports were far more likely to have appeared on the cemetery lists; the fact that more than half (51%) of those issued with passports later appeared on the cemetery lists indicates that at least half of the members of the elite who emigrated later returned. The fact that those issued with passports were less likely to have appeared on the muster-rolls can be explained by the fact that those issued with passports were more likely to have been young, and may therefore not even have been born yet when the muster-rolls were compiled.

The fact that those stationed at the military garrison are far less likely to have been issued with passports (only 6 out of 420 were issued with passports) is not surprising. First, while in military service, they were unable to emigrate, and second, on completion of their military service, those who did later emigrate are likely to have returned home first (many of those stationed in the military garrison were non-natives of Viana). Therefore, considering birthplace, marital status and occupation, it is expected that the comparisons between those issued with passports and those who were not may be somewhat confounded by the inclusion in the analysis of those stationed at the military garrison. Therefore, these three comparisons are repeated in Table 7.14 for the civilian elite only.

Table 7.14 Comparison of Members of the Civilian Elite With
No Passport Record with Those With
At Least One Passport Record

Characteristic	Passport Records	
	0(%)	≥1(%)
Birthplace		
Unknown	51	3
Known	49	97
Santa Maria Maior	27	26
Monserrate	15	18
Viana (Town/City)	49	70
Viana (Borough)	10	5
Viana (District)	15	10
Braga District	13	8
Elsewhere in Portugal	12	6
Elsewhere	1	1
Marital Status		
Unknown	11	-
Known	89	100
Single	29	58
Married	65	41
Widowed	6	1
Occupation Function		
Unknown	17	13
Known	83	87
Agriculture	4	3
Fishing	1	-
Trades & Industry	27	35
Transport	5	7
Commerce	20	30
Armed Forces	4	1
Public Administration	26	14
Professions	13	10
Special Occupations		
Proprietário	23	36
Clergy	4	1
Number of Members of the Elite	2564	144

The revised figures for birthplace and marital status in Table 7.14 are surprisingly similar to those in Table 7.13. Of course, the figures for occupation are quite different; this is because of the 420 members of the elite stationed in the military garrison, 326 were in the armed forces category, 43 were in the public administration category; also, 40 were in the professions category, and 2 were engaged in commerce (the remaining 9 had unknown occupations).

Considering birthplace, the figures indicate that those issued with passports are more likely to have been natives of the Town/City of Viana. Further, it can be seen that 30% of those issued with passports were non-natives of Viana; thus, 30% of elite emigrants were stage migrants. This compares with the figure calculated in Section 6.3, that 16% of all emigrants were stage migrants. Stage

migration is explored in more depth in Section 7.4.4.2. Considering marital status, the figures indicate that those issued with passports were more likely to be single; to some extent, this will be associated with the fact that some of these members of the elite were issued with passports before they were old enough to be members of the electorate, and that therefore these marital statuses were recorded when these members of the elite were at younger ages. Finally, with respect to occupation, the figures indicate that those issued with passports were more likely to be engaged in commerce, trades & industry, or transport, and less likely to be engaged in agriculture, fishing, the armed forces, public administration, or the professions.

Because so few members of the elite who were were stationed in the military garrison were issued with passports, the analyses in the remainder of this Section will exclude these members of the elite, thereby focusing on migration of what will be referred to as the civilian elite.

7.4.4.2 Stage Migration

Of the 2,708 members of the civilian elite, at least 682 were non-natives of Viana; i.e., in-migrants. Of course, it is likely that a lot more than 682 (25%) members of the civilian elite were in-migrants, but birthplace is only available for 1,383 (51%). The proportion of in-migrants among the members of the civilian elite for whom birthplace is known is far higher - 49%. For illustration, if the proportion of in-migrants was 49% for the whole of the civilian elite, then there would have been around 1,335 in-migrants.

Of the 682 in-migrant members of the civilian elite, 42 (6%) were issued with passports; these 42 were therefore stage migrants. This number is too small to allow detailed quantitative analysis; nevertheless, the characteristics of the 42 stage migrants are compared with those of the 640 other in-migrants, and the 701 natives of the Town/City of Viana in Table 7.15.

Table 7.15 Comparison of Natives, In-Migrants, and Stage Migrants

Characteristic	Natives N	Natives %	In-Migrants (No Passport) N	In-Migrants (No Passport) %	Stage Migrants N	Stage Migrants %
≥4 Component Names	252	36	235	37	21	50
Cemetery List Record	448	64	381	60	30	71
Birthplace						
Viana (Town/City)	701	100	-	-	-	-
Viana (Borough)	-	-	118	18	8	19
Viana (District)	-	-	197	31	15	36
Braga District	-	-	162	25	11	26
Portugal	-	-	151	24	7	17
Elsewhere	-	-	12	2	1	2
Parish of Residence						
Santa Maria Maior	447	64	402	63	30	71
Monserrate	254	36	238	37	12	29
Marital Status						
Unknown	4		6		-	
Known	697		634		42	
Single	220	31	174	27	21	50
Married	444	64	429	68	20	48
Widowed	33	5	31	5	1	2
Occupation Function						
Unknown	70		36		4	
Known	631		604		38	
Agriculture	34	5	14	2	2	5
Fishing	3	1	5	1	-	-
Trades & Industry	217	34	148	24	13	34
Transport	38	6	10	2	3	8
Commerce	127	20	187	31	11	29
Armed Forces	15	2	35	6	1	2
Public Admin.	118	19	137	23	4	11
Professions	79	13	68	11	4	11
Special Occupations						
Proprietário	223	35	160	26	12	32
Clergy	25	4	32	5	-	-
Total	701		640		42	

Before interpreting the figures in Table 7.15, it is necessary to mention several caveats in the analysis. First, the figures must be interpreted with some caution because they are calculated with respect to only the 1,383 members of the civilian elite for whom birthplace is known. Second, the definitions of the groups must be taken into account when comparisons are drawn between the groups. The natives are defined as members of the civilian elite who were born in Viana, irrespective of whether they ever migrated; i.e., this group consists of non-migrants, out-migrants, emigrants, return migrants, and repeat migrants. The in-migrants with no passport book record are defined as members of the civilian elite who were non-natives of Viana and who were not issued with a passport in Viana in the period 1835-1896; i.e., this group of in-migrants may contain

some stage migrants, return migrants, and repeat migrants. The stage migrants are defined as members of the civilian elite who were non-natives of Viana and who were issued with at least one passport in Viana in the period 1835-1896; i.e., this group may also contain some return migrants, and repeat migrants. Finally, when comparing the stage migrants with other groups, it must be borne in mind that there are only 42 stage migrants, so that percentages of stage migrants are quite volatile and might be misleading.

The figures in Table 7.15 may be interpreted as follows. Comparing the in-migrants with the natives, it can be seen that only their occupational distributions differ significantly. Essentially, in-migrants are more likely to have been engaged in commerce, the armed forces and public administration, and less likely to have been engaged in agriculture, trades & industry, transport, and the professions; in-migrants are also far less likely to have ever been recorded as **Proprietários**.

Comparing the stage migrants with the in-migrants with no passport book record, several differences are significant. Stage migrants are more likely to have had at least four component names than other in-migrants, and are more likely to have appeared on the cemetery lists. There is little evidence to suggest that stage migrants were more or less likely to have come from Viana's immediate hinterland or from further afield. However, stage migrants are far more likely to have been resident in Santa Maria Maior than other in-migrants. Also, stage migrants are more likely to have been single; but again, to some extent, this will be associated with the fact that some of these members of the elite were issued with passports before they were old enough to be members of the electorate, and that therefore these marital statuses were recorded when these members of the elite were at younger ages. Finally, there is some evidence to suggest that stage migrants are more likely to have been engaged in trades & industry than other in-migrants; stage migrants are also more likely to have ever been recorded as **Proprietários**. In conclusion, it can be seen that even among in-migrants to Viana, emigration appears to have been a selective process, selecting amongst the wealthier sectors of society.

7.4.4.3 Return Migration

Of the 2,708 members of the civilian elite, 144 (5%) were issued with passports; of these, 125 (87%) later appeared on the electoral registers, reappeared in the passport books, or appeared on the cemetery lists. The level of return migration among the civilian elite implied by these figures is, quite simply, remarkable.

In fact, the implied level of return migration brings into question the validity of the record linkage which generated the life histories. In order to investigate this, the life histories of the 125 return migrants might be scrutinised. However, it must be borne in mind that the record linkage algorithm which generated these life histories (described in Section 4.6) was specifically developed to be both accurate, and fully automatic. Also, manual scrutiny of life histories is unlikely to be either objective, or consistent. Nevertheless, it seems appropriate to classify life histories subjectively, according to whether there appears to be little doubt as to their validity, some doubt as to their validity, or considerable doubt as to their validity.

This approach is illustrated with an example life history of each classification. First, there appears to be little doubt as to the validity of the life history of Gaspar Teles Falcão Castro. In 1841, Gaspar Teles Falcão Castro was issued with a passport; his birthplace was the Town of Viana, he was 15 years old, and single. In 1872, 31 years later, Gaspar Falcão Castro began to appear on the electoral registers of the parish of Santa Maria Maior; he was 46 years old, married, and a **Proprietário**. Thereafter, he appeared on every electoral register up to and including that of 1895. In 1895, Gaspar Falcão Castro appears on the cemetery lists; his birthplace was the parish of Santa Maria Maior, he was 71 years old, married, and a **Proprietário**. Indeed, it would appear that Gaspar Teles Falcão Castro may have been a typical **Brasileiro**.

Second, there appears to be some doubt as to the validity of the life history of João Pereira Viana. In 1844, João Pereira Viana was issued with a passport; his birthplace was the Town of Viana, he was just 12 years old, and was recorded as being an artist. In 1866, 12 years later, João Pereira Viana began to appear on the electoral registers of the parish of Monserrate; he was 37 years old, single, and the captain of a ship. Thereafter, he appeared on every

electoral register up to and including that of 1891. During that period, his estimated year of birth ranges from 1825 to 1829, and he was recorded as being married and a trader in 1872 and subsequent years. In 1894, João Pereira Viana appears on the cemetery lists, he was 64, married, and a merchant.

Finally, there appears to be considerable doubt as to the validity of the life history of João da Cunha Ferreira. In 1827, João da Cunha Ferreira was recorded on the muster-rolls as a resident of number 17, Rua da Misericordia, in Santa Maria Maior, and as one of five sons of António da Cunha Ferreira; his date of birth was 30 December, 1809; his father was a baker, one of his brothers was absent in Rio de Janeiro, and two others, a surgeon and a carpenter had left the military District of Viana. In 1834, João da Cunha Ferreira began to appear on the electoral registers of the parish of Santa Maria Maior; he was 28 years old, married, and a merchant. Thereafter, he appeared on the registers of 1835 and 1838, before being issued with a passport in 1842; according to his passport, he was 31 years old, married, and a merchant. In 1858, 16 years later, two individuals named João da Cunha Ferreira began to appear on the electoral registers of the parish of Santa Maria Maior; one was 59 years old, the other 58 years old, both were married, and both were blacksmiths. Thereafter, they both appeared again on the register of 1859, and one of them appeared on the register of 1860.

In summary, it is likely that Gaspar Falcão Castro was a return migrants, and it is possible that João Pereira Viana was a return migrant, but it is unlikely that João da Cunha Ferreira was a return migrant.

Turning to the classification of the 125 life histories of return migrants, it is felt that there is little doubt as to the validity of 101, there is some doubt as to the validity of a further 18, and there is considerable doubt as to the validity of the final 6. In order to investigate the problem further, the investigation is repeated for the 17 life histories of return migrants with periods of first absence exceeding 20 years; these 17 life histories are the most likely to be invalid. Of the 17 life histories, it is felt that there is little doubt as to validity of 4, there is some doubt as to validity of a further 10, and there is considerable doubt as to the validity of the final 3. A comparison of the results of the two

analyses suggests that the life histories which are most unlikely to be valid are among those with longer durations of absence.

In conclusion, these two analyses suggest that the validity of the record linkage is acceptable; and therefore, the level of return migration among the civilian elite is very likely to have been remarkably high, lying somewhere between 70% (101/144) and 87% (125/144). It is interesting to compare this figure of 70-87% with the range of the estimates presented in Section 2.7.3 of 30-40% for Portugal during the second half of the nineteenth century.

Since the level of return migration is likely to have been so high, a comparison of return migrants with non-return migrants serves little purpose. However, the distribution of durations of absence is of particular interest. Durations of absence can be calculated as the number of years between the year in which an individual was issued with a passport, and the year in which that individual reappeared in the elite - on the electoral registers, in the passport books, or on the cemetery lists. The durations of first absence from Viana are presented in Table 7.16.

Several caveats are noted with respect to the figures in Table 7.16. First, the figures are approximate; for example, an individual absent for six months within one calendar year may appear to have been absent for 0 years, while an individual absent for six months spanning the end of the year may appear to have been absent for 1 year. Also, for those individuals who reappear on the electoral registers, the figures will be dependent on the time of the year at which the registers were compiled. Further, the figures provide an upper limit for durations of absence, because individuals may only have reappeared on the manuscript documents some time after returning to Viana.

Table 7.16   Return Migration: Duration of First Absence

Maximum Period of Absence	Frequency	%	Σ%
0	2	1.6	1.6
1	30	24.0	25.6
2- 5	30	24.0	49.6
6-10	18	14.4	64.0
11-15	19	15.2	79 2
16-20	9	7.2	86.4
21-25	5	4.0	90.4
26-30	5	4.0	94.4
≥31	7	5.6	100.0
Total	125	100.0	

The figures provide a mean duration of first absence of 9 years, with a standard deviation about this mean of 10 years. This is likely to be an over-estimate for two reasons. First, the analysis includes life histories whose validity is uncertain, and these life histories tend to include longer periods of first absence. Second, as mentioned above, the figures provide an upper limit for the period of first absence.

Nevertheless, it is interesting to compare this distribution with one from the literature reviewed in Section 2.3; Tedebrand (1976b:225) finds that of 1,193 emigrants from Västernorrland, Sweden, who returned from North America in the period 1880-1913, 30% stayed for only one year, 17% for two, 14% for three, 11% for four, 23% for five to nine, and the other 5% for ten or more years. On the one hand, the figures for very short durations are similar, suggesting that the extent of commercial migration from Portugal corresponded with that of international labour migration from Sweden. On the other hand, the figures for longer durations suggest that, in general, Portuguese return migrants may have been absent for longer.

An immediate explanation of the high levels of return migration suggested in this Section would be extensive commercial migration. However, the distribution of durations of first absence, although skewed to the left, indicates that only 26% of return migrants were absent for less than two years, and only a further 24% of return migrants were absent for between two and five years. Therefore, while commercial migration is likely to have been an important component of migration, other types of return migration are likely to have been just as important.

Finally with respect to return migration, close examination of the 125 life histories reveals that seven provide clear examples of

mercantile migration; these individuals were issued with passports when they were young **caixeiros**, and later returned to Viana as merchants, traders, and **Proprietários**.

7.4.4.4 Repeat Migration

Of the 2,708 members of the civilian elite, 144 (5%) were issued with passports; of these, 125 have been identified as possible return migrants; and of these, 25 were issued with more than one passport. Thus, 17% of emigrants became repeat migrants, and 20% of return migrants became repeat migrants. The numbers of times that these 25 repeat migrants were issued with passports are presented in Table 7.17.

Table 7.17 Frequencies of Repeat Migration

Number of Passports	Frequency
1	119
2	16
3	5
4	2
5	1
6	1
Total	144

Further, the characteristics of the 25 repeat migrants are presented in Table 7.18.

Table 7.18 Repeat Migrant Characteristics

Characteristic	Frequency
≥4 Component Names	7
Cemetery List Appearance	14
Parish of Residence	
Santa Maria Maior	10
Monserrate	15
Birthplace	
Viana (Town/City)	20
Viana (Borough)	2
Viana (District)	1
Elsewhere	2
Occupation	
Unknown	3
Trades & Industry	8
Transport	2
Commerce	10
Professions	2
Proprietário	9
Total	25

The figures indicate that repeat migrants were mostly natives of the Town/City of Viana, engaged in trades & industry or commerce; this provides evidence that commercial migration may have been responsible for most of the repeat migration; this would hardly be surprising. It is interesting to note that the majority of repeat migrants were residents of Monserrate; this suggests that those engaged in commercial migration, although possibly quite wealthy, are likely to have lived close to the port, rather than in the commercial hub of Santa Maria Maior. Finally, since only just over half of the repeat migrants later appeared on the cemetery lists, there is some evidence to suggest that some of these repeat migrants eventually remained abroad, or settled elsewhere in Portugal.

7.4.5 Inferential Evidence of Migration

Inferential evidence of migration of the elite is available from the electoral registers, since members of the elite whose last record is an electoral register record may have been out-migrants to other parts of Portugal. Of course, sometimes the individual may have emigrated from Viana after 1896, or may have died in Viana after 1922. However, as discussed with respect to the restriction of the elite (Section 7.4.2), few of the life histories of members of the elite are likely to be censored.

In this Section, first, inferential evidence of migration is illustrated with the example of military personnel; and second, inferential evidence of migration among the civilian elite is examined with models of their durations on the electoral registers.

7.4.5.1 Migration of Military Personnel

An ideal example of inferential evidence of migration among the elite is provided by those stationed in the military garrison of Viana - the military elite. Of the 420 life histories of military personnel, only 6 (1%) include a passport book record, and only 46 (11%) include a cemetery list record. This suggests that 88% of military personnel out-migrated from Viana to other parts of Portugal before they died. Of course, some of them may subsequently have emigrated, and some of these may later have become return migrants or repeat migrants. Nevertheless, the inferential evidence indicates extremely high levels of mobility among the military elite. This is hardly surprising! However, a similar analysis, albeit at a more sophisticated level, may be conducted among the civilian elite to provide inferential evidence of migration among the civilian elite.

7.4.5.2 Analysis of Duration on the Electoral Registers

The length of time spent by different electors on the registers is provided by considering the length of time between an individuals first and last appearance. Variations in the length of time spent on the registers are illustrated in Figure 7.4, which shows the proportion remaining on each register by duration since first appearance for four cohorts: those appearing first on the electoral registers of 1834 (234), 1851 (146), 1863 (140), and 1872 (131). These four cohorts are chosen because they arise in years with large numbers of new electors, of which a relatively large proportion of electors remained on the registers for some time.

Figure 7.4 can be interpreted as follows. For the cohort of the elite first appearing on the electoral registers in 1834, there can be seen to be a steady gradual decrease in the proportion remaining on the electoral registers. This is reasonable because the 1834 cohort includes some of the wealthiest inhabitants of Viana, who were the most likely to appear on the first electoral register. Also, the majority of the 1834 cohort are likely to have died by 1878, after which electoral registers are no longer available annually. For the 1851, 1863, and 1872 cohorts, the decrease in the proportion remaining on the electoral registers is initially far greater than that for the 1834 cohort. This is because these cohorts appeared through the inclusion of individuals closer to the margin of the franchise than those in the 1834 cohort. Later however, the decrease in the proportion remaining on the electoral registers can be seen to settle down until it is actually less than that of the 1834 cohort. This is due to relative selection effects; for example, those in the 1851, 1863, and 1872 cohorts were, on average, younger than those in the 1834 cohort. Finally, towards the end of the period, it can be seen that large discrete decreases in the proportions of the 1851, 1863, and 1872 cohorts remaining on the electoral registers occur as the intervals between consecutive electoral registers increase.

Figures 7.4 Proportions Remaining on the Electoral Registers
by Duration Since First Entry in the
Years 1834, 1851, 1863, and 1872
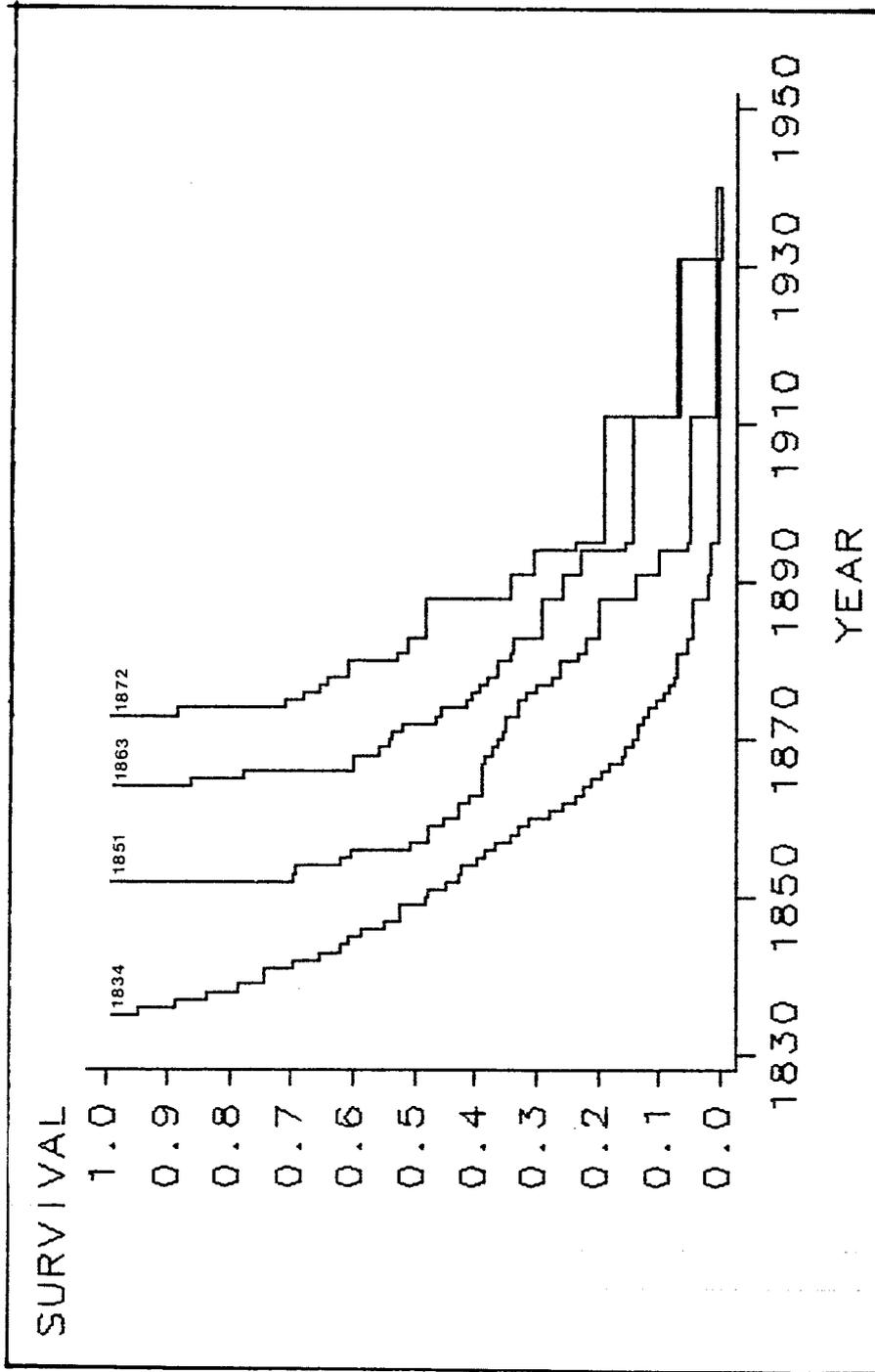
In order to examine duration on the electoral registers more closely, survival analysis techniques are used. Initial experiments were conducted using a model of the general form described in Section 7.2.4, specified by equations (7.2.16 - 7.2.20); and modified to correspond with the observational plan described in Section 7.2.5. These experiments were conducted using software developed in FORTRAN which employed an external routine to maximise the relevant likelihood[30]. However, several technical problems were encountered with this approach which, to be resolved, would have required extensive development of specialist software. Under the circumstances, it was thought that similar results could be obtained by estimating carefully chosen standard proportional hazards survival analysis models using a standard statistical package - BMDP.

Duration of appearance on the registers is therefore modelled using a proportional hazards survival analysis model (see Section 7.2). The model postulates that the covariates X of an individual affect a baseline hazard function h_0 multiplicatively, so that:

$$p(t,X;\theta,\beta) = h_0(t;\theta) \cdot e^{\beta X(t)} \qquad (7.4.1)$$

where $p(t,X;\theta,\beta)$ is the probability that an individual's last
appearance is after t years on the register given
that they appear for t-1 years,

$h_0(t;\theta)$ is an underlying distribution of the duration spent
on the register by the electors as a whole,

X(t) reflects the background characteristics of an
elector at time t, and

β is a vector of the estimated parameters which give
the influence of particular characteristics.

Essentially the model states that individuals have a probability of leaving the registers for the last time which depends on the length of time since they first appeared on them. This probability

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[30] The external routine was E04CGF of the NAG library, an easy-to-use quasi-Newton algorithm for finding an unconstrained minimum of a function (see Gill & Murray, 1972).

may be affected by an individual's characteristics, but these effects will be independent of time[31].

It is important to emphasise that while the effects of an individual's characteristics on his probability of leaving the registers are independent of time, his actual characteristics are time dependent; i.e. as duration on the registers increases an individual's age increases, his marital status may change, etc.. These changes in individual characteristics are incorporated in the model as the time dependent covariates, $X(t)$. Thus, an individual's likelihood is calculated allowing for periods of duration on the registers in different age intervals, marital statuses, occupations, and parishes of residence.

The model was estimated for the dataset including all members of the civilian elite who appeared on the electoral registers more than once (1,872).

Now, departure from the civilian elite arose through one of three competing risks: death (cemetery list record), emigration (passport book record), or out-migration (electoral register record). Therefore, because it is the latter risk that is of interest, members of the elite whose last appearance was a passport book record or a cemetery list record were considered to be censored (817). At first sight this approach appears a little strange; however, it is necessary because the model is being used to examine out-migration to other parts of Portugal, and an individual who emigrates or dies might have out-migrated to other parts of Portugal had he not left the elite through these other risks. There are two main potential sources of error with this approach: first, if individuals died in Viana, but did not appear on the cemetery lists; and second, if individuals emigrated from Viana without passports, or emigrated with passports issued elsewhere.

Also, individuals who last appeared on the electoral registers in the period 1834-1855 were considered to be censored (498). This is because the cemetery lists are only available from 1855, so that it is not known whether individuals leaving the registers before 1856 died in Viana, or elsewhere. Thus, the problem of unobserved heterogeneity in the competing risks is overcome by restricting the

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[31] For a detailed description of Cox's proportional hazards model, see Cox & Oakes (1984).

contribution of information pertaining to the individuals for whom the mode of exit is unknown.

Finally, another drawback of the approach outlined above is that temporary absence is ignored, so that an elector who appeared only on the 1834 and the 1880 registers, say, would be counted as having been present for 47 years. However, examination of the data reveals that individuals with such electoral experiences are extremely rare, so this is not a problem.

The reference group chosen for the underlying distribution of duration was that of individuals with four or more component names who were resident in Santa Maria Maior, were at least 55 years old, were married, were engaged in commerce and had been recorded as being **Proprietários**, and last appeared on the registers after 1878. This group was chosen as being perhaps the least likely to out-migrate to other parts of Portugal.

Parameter estimates were obtained for the relative effects on the probability of leaving the registers for the following characteristics: three or less component names; resident in Monserrate; age intervals ≤34, 35-54, and age unknown; marital status single, widowed and unknown; occupations in agriculture, fishing, trades & industry, transport, armed forces, public administration, and professions; not recorded as being **Proprietários**; and last appearance on the registers in the period 1856-1878. No parameters of interactions between these characteristics were estimated. The parameter estimates for the model are presented in Table 7.19.

Table 7.19 Parameter Estimates of the Model of
Duration on the Electoral Registers

Parameter	Estimate	Standard Error	Relative Risk	
Reference Group (RG):				
≥4 Component Names				
Parish				
Santa Maria Maior				
Age				
≥55				
Married				
Occupation				
Commerce				
Proprietário				
Period of Exit				
1880-1931				
≤3 Component Names	0.1468	0.0887	1.1581	
Parish				
Monserrate	0.0548	0.0884	1.0563	
Age				
≤34	-0.3544	0.1976	0.7016	
35-54	-0.1594	0.1106	0.8526	
Unknown	0.6832	0.3419	1.9802	*
Marital Status				
Single	0.1603	0.1137	1.1739	
Widowed	0.1122	0.1287	1.1187	
Unknown	1.0370	0.3362	2.8207	*
Occupation				
Agriculture	0.5072	0.2603	1.6607	
Fishing	1.2572	0.3334	3.5154	*
Trades & Industry	0.3901	0.1410	1.4771	*
Transport	0.8514	0.1983	2.3429	*
Armed Forces	-0.1510	0.3436	0.8599	
Public Administration	0.8598	0.1395	2.3627	*
Professions	0.4766	0.1793	1.6105	*
Unknown	1.6644	0.1860	5.2825	*
non-Proprietário	1.1273	0.1264	3.0874	*
Year of Exit				
1856-1878	1.5020	0.0935	4.4905	*

Parameter estimates significant at the 5% level are denoted by *.
Global Chi-Square Statistic: 543.92, 18 Degrees of Freedom.

The basic interpretation of these results is quite straightforward. For example, the significant parameter estimate for the period of last appearance 1856-1878 indicates that, other things

being equal, the probability of leaving the registers in the period 1834-1855 was more than four times that for the period 1880-1931.

The parameter estimate for those with names consisting of three or less components is not significant at the 5% level, but would be at the 10% level (p-value 9.7%); this suggests that those with less component names may have been slightly more likely to leave the registers than those with longer names.

The parameter estimate for those resident in Monserrate indicates that there were no significant differentials in the probability of leaving the registers between parishes of residence.

Considering age and marital status effects, only the unknown categories yield significant parameter estimates. Individuals for whom age is unknown were almost twice as likely to leave the registers; individuals for whom marital status is unknown were almost three times as likely to leave the registers. Also, individuals for whom occupation is unknown were more than five times as likely to leave the registers. Combining these results, individuals for whom age, marital status, and occupation information is unknown were almost 30 times as likely to leave the registers as individuals who were aged at least 55, married, and engaged in commerce. Unfortunately, little can be said about this mysterious highly mobile sub-group of the civilian elite.

Considering occupation effects in more detail, those engaged in commerce were among the most unlikely members of the civilian elite to leave the registers. Among the more likely to depart were those members of the civilian elite engaged in fishing (3.5 times), transport (2.3 times), and public administration (2.4 times). Also, those who were never recorded as being **Proprietários** were more than three times as likely to leave the registers.

In conclusion, it is worth emphasising that of the 1,923 members of the civilian elite included in this analysis, at least 618 appear to have departed from Viana during the period 1856-1931. This in itself suggests very high levels of out-migration to other parts of Portugal. Further, combined with the evidence of high levels of in-migration among the elite identified in this Chapter, the analysis is consistent with that of the muster-rolls, which suggested that Viana appears to have been a stage in migration from the hinterland to Porto, Lisboa, and beyond.

7.5 Summary

The record linkage of the Viana data described in Chapter 4 provides a reconstitution of a sub-group of the population of Viana. Currently, this sub-group comprises males with recorded names consisting of three or more components. In this Chapter, attention was further restricted to males with recorded names consisting of three or more components who appeared at least once on the electoral registers - this group was referred to as the elite. The analyses presented in this Chapter examined evidence of migration among this elite.

In studying the migration of the elite, the time elapsing between the arrival of an individual, whether by birth or in-migration, and their subsequent departure at some later date, whether by out-migration or death, is of interest. Survival analysis is a method by which the time elapsing between two such predefined events is studied. Some important issues in survival analysis were therefore reviewed with respect to the study of migration of the elite. Survival analysis was introduced in its earliest form - traditional life table analysis. The development and limitations of the proportional hazards model were discussed; approaches to the problem of unobserved heterogeneity were reviewed; mixture models were considered; and finally, alternative observational plans were described.

Next, the electorate was identified and described using log-linear models to compare the characteristics of the electorate in the census years of 1864 and 1878 with the population from which it was drawn. An analogous analysis was then performed to compare the characteristics of the elite with those of the electorate. The elite were found to be a biased sample of the electorate, weighted in favour of residents of the parish of Santa Maria Maior during the period 1850-1878, who were unmarried, and were engaged in commerce, the armed forces, public administration, or the professions.

Migration of the elite was analysed through an examination of indirect and inferential evidence of temporary and permanent absence from Viana. The retrieval of a statistical file of individual life histories from the database was described; and the restriction of the dataset was considered in the context of the circumstances under which the original manuscript sources were created. Then, several

exploratory analyses of the restricted elite were described; these provided some initial insight into the generation of individual life histories, while also serving to verify the quality of the data.

Indirect evidence of migration of the elite was examined; the passport book records were used to provide estimates of emigration, stage migration, return migration and repeat migration. The analyses suggested that the level of emigration exceeded 5%. Of these emigrants, a considerable proportion (25-49%) were stage migrants. Return migration was estimated to be of the order of 70-87%. And, of these return migrants, 20% later became repeat migrants. The figure of 70-87% for return migration was compared with the range of the estimates presented in Section 2.7.3 of 30-40% for Portugal during the second half of the nineteenth century.

Finally, inferential evidence of migration of the elite was examined; in particular, models of duration on the electoral registers were estimated. The estimation of relatively sophisticated models such as those developed in Section 7.2.4 and modified in Section 7.2.5 was abandoned in favour of carefully chosen standard proportional hazards survival analysis models that could be estimated using a standard statistical package - BMDP. The inferential evidence of out-migration (excluding emigration) provided by the results of the analysis suggested that there while out-migration was not significantly dependent on age, or marital status, there were large occupational differentials, and significant period effects.

In conclusion, it is worth emphasising that the analyses presented in this Chapter were entirely dependent on the record linkage described in Chapter 4. Thus, the reconstitution of the elite of Viana has proved to be an extremely powerful tool in the identification of migration, and the decomposition of migration into its constituent components.

CHAPTER 8

SYNTHESIS

8.1 Introduction

The aim of this thesis was to provide an analysis of the components of migration to and from the Port-city of Viana do Castelo, and its hinterland during the period 1826-1931. In the process, both methodological and substantive issues have been addressed in several areas: the study of migration, and emigration from Europe and Portugal in particular; the estimation of log-linear models of emigration using aggregate data; the estimation of levels of clandestine emigration using a population model; the history of Viana, and the history of Portugal during the nineteenth century; the application of record linkage techniques to the reconstitution of Viana using nineteenth century manuscript sources; an analysis of the components of migration using pseudo-aggregate data from the manuscript sources; and an analysis of the components of migration applying both simple and relatively sophisticated statistical techniques to individual life histories of members of the reconstituted population of Viana.

In order to differentiate as clearly as possible between the different areas, the preceding chapters were designed to be as independent as possible. The aim of this final Chapter is to synthesise the methodological and substantive issues addressed in the various areas, and to provide some suggestions for further research within the field in general, and with respect to the Viana Project in particular.

8.2 Synthesis

Over the last 500 years, emigration has played an integral part in the evolution of the demographic structure of Portugal. Initially, its purpose was the colonisation of Portugal's overseas territories. This was gradually overshadowed by its function as an opportunity for individuals to seek improved circumstances. During the last 100 years or so, emigration from Portugal reached levels surpassing those of most other European countries, and the country registered a net population loss second only to that of Ireland.

Historically, while migration has always been as constant a demographic phenomenon as fertility or mortality, it assumed a new dimension when the first voyages of discoveries excited European interest in many far-flung potential sources of wealth. The importance of colonist settlements in the race to claim newly discovered lands during the following centuries cannot be over-estimated.

During the century between the end of the Napoleonic Wars and the outbreak of the First World War, the European economy expanded as a result of enormous technological achievements, causing a drastic reorganisation of employment patterns. Consequently, emigration was pushed to levels previously unknown and subsequently unrepeated, as people poured out of Europe in ever increasing numbers to less-settled parts of the world.

Further, as the nineteenth century progressed, and travel time was sharply reduced with the increasing use of steam-travel, return migration assumed a new importance throughout Europe. In Portugal, remittances from emigrants had always had an influence on the economy, but in the late nineteenth century the economy of northern Portugal in particular was influenced by the **Brasileiros**, native born Portuguese who emigrated to Brazil to make their fortune and returned to Portugal to display their success.

The quantitative importance of Portuguese emigration has not been reflected in the literature; many of the major issues in European emigration have not yet been approached with respect to Portugal. Also, return migration has not been studied extensively; most notably, its levels, its impact on the economy, and the demographic structure of the return migrants have been under-explored.

This thesis considered population change at two levels in order to identify and examine the components of migration to and from the Port-city of Viana do Castelo, and its hinterland (the northernmost district of Portugal). Aggregate data from the passport books and censuses of 1864, 1878, 1890 and 1900 were supplemented by a database of individual-level data drawn from manuscript sources compiled in the City: muster-rolls, 1826-1833; electoral registers, 1834-1931; passport books, 1835-1896; and cemetery lists 1855-1922.

Changes in the level and structure of emigration from the District of Viana were identified using log-linear models of emigration rates, and the extent of clandestine emigration was investigated using a simple model of population change. The reconstitution of the City of Viana was described in detail, focusing on the software and techniques developed for the record linkage. Components of migration to and from the City of Viana were identified for the whole population, and for the elite (members of the electorate with names consisting of at least three components). Migration of the elite was also inferred and examined using survival analysis techniques.

Chapter 2 surveyed the literature on migration. First, traditional and contemporary theories and models of migration were discussed. Theories and models of migration can be broadly classified as causal or impact theories, which can be formulated at three levels: the individual, the household, and larger, more anonymous groups. Also, migration theories fall into one of the following two categories: those which have been developed quantitatively, and those which have not. Further, migration theories are strictly divided into those which are described as equilibrium models, and those which are said to assume a historical-structural perspective; it was argued that the latter produce forces of the type incorporated in the former.

The discussion of theories and models of migration presupposes that movements have been identified and classified along some criteria. In historical demography this supposition is rarely justified, and the researcher is often forced to adopt indirect methods in order to identify migration. The identification of migration is divided according to the evidence on which it is based;

studies relying on direct, indirect, and, more recently, inferential evidence of migration were reviewed.

Whichever source of evidence of migration is used, once a movement is identified, it must be carefully classified for the purposes of analysis, and to ensure the that the results from different studies are comparable. Migration flows are classified according to components such as in-migration and out-migration, emigration, legal emigration and clandestine emigration, return migration, and repeat migration; and also according to other criteria, such as whether they are temporary or permanent, short or long distance, rural to urban, etc..

Having established an analytical framework for the study of migration, emigration from Europe during the century between the end of the Napoleonic Wars and the outbreak of the First World War was discussed, focusing on issues such as the origins, characteristics, and destinations of emigrants, and the substantial levels of return migration witnessed from the late-nineteenth century. In particular, the failure of traditional theories of loss of land, over-population, industrialisation, and urbanisation as explanations of trends in the level and characteristics of these emigrations was examined.

From this juncture, emigration from Portugal was introduced within the constraints imposed by the paucity of the statistics available for the sixteenth century. It emerges that a study of Portuguese emigration would be meaningless without a discussion of Brazilian immigration; during the nineteenth and early-twentieth centuries Brazil absorbed the vast majority of Portuguese emigrants, and almost a third of all immigrants to Brazil were Portuguese.

Initially, Brazilian immigration policies were designed to promote colonisation. However, during the nineteenth century, these were gradually augmented and finally replaced by policies which were primarily designed to guarantee an elastic supply of labour. The politics of Brazilian immigration in the nineteenth century were therefore associated with one or other of two distinct immigration flows: the establishment of small colonist settlements, and the import of free wage-labourers to replace slaves. It was the latter flow which turned into the mass immigration witnessed in the late-nineteenth and early-twentieth centuries. It was noted however, that despite the frequency and size of the great waves of immigration to Brazil, the substantial increase in the Brazilian population

during the same period was attributable more to high fertility and low mortality than to immigration.

Returning to Portugal, the considerable role that emigration played in the evolution of the demographic structure of the country over the last 500 years simultaneously ensured its adoption as a topic of much dissent. Historically, attitudes to emigration were complex, with society undecided as to whether emigration was a good or bad thing. Thus, governments remained wary of directly prohibitive measures in fear of the strong reactions that might be provoked. Turning to the nineteenth century, the roots of governmental concern at the levels of emigration are uncertain, but it is likely that increasing numbers of males failing to report for military service, and unofficial details of clandestine emigration led to the introduction of legislation designed to curb this trend. The politics of Portuguese emigration were discussed, and important bodies of nineteenth-century legislation concerning emigration were summarised.

Finally in Chapter 2 studies of Portuguese emigration were reviewed. In comparison with the literature of European emigration, even the work of contemporary Portuguese scholars tends to be rather poor. Essentially, this is because there has hitherto been a heavy reliance on anecdotal information, and a (closely associated) tendency to assume a historical-structural perspective of migration, thereby avoiding any detailed (quantitative) analysis. Many of the issues in European emigration have not even been approached with respect to Portugal. The detailed identification of the process of emigration has remained largely speculative because of the lack of systematically collected statistics. Nevertheless two themes have remained central, the strong association of early emigration with commerce, and the later exodus with the system of agriculture practised in the north-west of the country. These themes are corroborated by a vast amount of anecdotal information, and some quantitative evidence.

The review of studies of Portuguese emigration was divided into several topics: emigrants characteristics, clandestine emigration, return migration, and emigrant remittances. Clandestine emigration consisted of two streams: that of males aged 14-21, who were unable to obtain passports because of military conscription legislation, and that consisting of people for whom the price of a passport was

prohibitively high. The discussion of return migration was centred upon the myth of fortune and return which still persists today; the **mineiro de torna viagem** (return migrant miners) of the eighteenth century became the **Brasileiro** (return migrant from Brazil) of the nineteenth, who, in turn, has become the **Francês** (return migrant from France) of the late twentieth century. With respect to remittances, although it is known that Portugal's fragile economy of the nineteenth century came to rely heavily on the income generated by the remittances and return of its emigrants, very little quantitative evidence is actually available. In conclusion, a broad comparison of the characteristics of the Portuguese emigrants with those of other European countries illustrates that Portuguese emigration possessed some unique features. First, emigrants were predominately male until relatively recently. Second, in the nineteenth century, a large proportion of these male emigrants were young, often less than 14 years old. Third, the proportion of emigrants departing individually was decreasing in Portugal, while it was increasing throughout most of Europe. Finally, while the extent of return migration increased elsewhere, in Portugal it decreased.

Chapter 3 examined aggregate emigration data for the District of Viana (the Alto Minho) during the second half of the nineteenth century. First, the agriculture, population and technological development of the District were described in detail, in order to identify important economic and demographic characteristics of the area under consideration. Changes in the level and structure of emigration from the District were identified by comparing emigrant characteristics (available from the passports issued in the three census years 1864, 1878, and 1890), with those of the population from which the emigrants were drawn (available from the censuses) using log-linear models of emigration rates. The analysis was supplemented by the application of a simple model of population change which enabled the extent of clandestine emigration to be investigated.

The paucity of aggregate demographic statistics for nineteenth century Portugal forces various sources of ancillary data to be exploited fully. An increasingly popular approach involves the reconstitution of one town or city using a database of several manuscript sources; this enables micro-level analyses to be performed

which enhance the understanding of the secular demographic trends that are derived from those aggregate statistics that are available.

The City of Viana do Castelo, situated on the northern bank of the mouth of the River Lima, provides an ideal opportunity for the investigation of these phenomena through the reconstitution of its population from the abundance of records generated by the Portuguese administrative system. With a population of just less than 10,000 during the nineteenth century, it is large enough to limit the effects of random variation, while not too large to preclude close examination of the individual-level data. In addition, its role as the administrative centre and principal port of the District of Viana offers the study of stage migration of the rural peasantry, and the migration of both the urban poor and elite.

Chapter 4 described the reconstitution of the City of Viana do Castelo. First, the economic and demographic history of the City was discussed, and local and national events in the nineteenth century were summarised in order to establish the circumstances under which the sources being used were created. Aggregate census data were used to provide an initial picture of the population. The manuscript sources (muster-rolls, electoral registers, passport books, and cemetery lists) on which the reconstitution is currently based were then described in detail.

Reconstitution methodology was introduced with a review of record linkage techniques. Record linkage studies are classified according to whether or not variation and errors exist in identifying items of information, and whether or not there is duplication of identifying item sets. The combination of these problems determines the approach to record linkage. Nevertheless, it was argued that whatever approach is adopted ought to be fully automatic; ensuring both that linkage criteria are carefully defined beforehand, and that those criteria are consistently applied.

In order to enable records to be linked both within and between documents for subsequent analysis, several operations - the software requirements of record linkage - must be possible. One way to satisfy these requirements is to store the data in a powerful database. Reasons for choosing the Scientific Information Retrieval (SIR) Data Base Management System (DBMS) for the storage, standardisation and coding, linkage, and subsequent retrieval of the

Viana data were discussed, together with the actual software and techniques adopted.

In Chapters 5, 6 and 7, analyses of components of migration were presented, examining evidence of migration to and from Viana during the period 1826-1931.

Chapter 5 used the muster-rolls to provide a picture of the population, and migration to and from Viana. The muster-rolls are the only systematically collected source of demographic data available for Portugal during the period 1820-1835. As such, they provide an ideal opportunity for the study of the structure of the country's population in the years spanning the civil war of 1828-1834, which preceded the reforms that were introduced following the advent of liberalism in 1834.

The advantage of a household listing compiled at one point in time and then repeatedly updated is that not only is it possible to examine the population at the time the document was first drawn up, but also to investigate the dynamics of the population over a period of time. Thus, besides identifying the levels of mobility, this Chapter provided a base population for reference in those that follow. Unfortunately however, those included on the muster-rolls did not constitute the entire population, as spinsters and widows who were not heads of households and who did not have male children were excluded.

The analysis of the muster-rolls demonstrated that substantial levels of male migration to, within, and from, but not back to, Viana existed during the period 1826-1833. However, due to the nature of the muster-rolls, comparatively little is known about the destinations of out-migrants, and virtually nothing is learnt about the mobility of the female population.

Chapter 6 presented evidence of migration to and from Viana during the period 1835-1922 which allowed these issues to be addressed. Two main components of migration were examined: first, trends in in-migration were identified from birthplace information recorded on the cemetery lists; second, trends in emigration were identified from the passport books.

Unlike the muster-rolls, both the documents analysed in this Chapter were compiled for the whole population of Viana; nobody was specifically excluded from appearing; however, considering the passport books, clandestine emigrants remain elusive. Further, neither of the analyses presented was dependent on the record linkage process; they were performed on data aggregated from the manuscript sources.

On the one hand, the first analysis indicated substantial levels of female migration, and suggested that the level of out-migration from the City was significantly higher for natives of Monserrate than for those who had been born in Santa Maria Maior. On the other hand, the second analysis illustrates the virtual absence of females among emigrants until the late nineteenth century, and that natives of the two parishes of Viana were roughly equally likely to emigrate legally. Combining the evidence of both analyses, it was suggested that natives of the less prosperous parish - Monserrate - were more likely to migrate to other parts of Portugal, or to emigrate without a passport. Similarly, females were more likely to migrate to other parts of Portugal, but it is unlikely that many emigrated without passports.

The analysis of the passport books provided a detailed picture of emigration from Viana during the nineteenth century, illustrating that the majority of emigrants were single males less than 21 years old, often being sent to Brazil to avoid military conscription. Also, a significant proportion of emigrants from Viana were shown to be stage migrants, mainly from Viana's immediate hinterland, but with some from further afield.

However, two components of migration remained beyond the scope of this Chapter: return migration and repeat migration. The identification of these components is entirely dependent on the record linkage process, and is therefore only discussed in Chapter 7, in the context of migration of the elite, for whom the record linkage described in Chapter 4 is most accurate.

Chapter 7 examined evidence of migration among a sub-group of the electorate of Viana. This sub-group was defined as those individuals with recorded names consisting of three or more components who appear at least once on the electoral registers. The former part of this definition was necessary because the

reconstitution of the population of Viana is currently restricted to males with recorded names consisting of three or more components. This sub-group of the electorate was referred to as the elite because there is known to have been an association between socioeconomic status and the number of components of Portuguese names. Of course, it is noted that for a definition of particular group this approach is somewhat simplistic; for example, individuals with three or more component names who were recorded on electoral registers with just two or less component names are simply omitted.

In studying the migration of the urban elite, the time elapsing between the arrival of an individual, whether by birth or in-migration, and their subsequent departure at some later date, whether by out-migration or death, is of interest. Survival analysis is a method by which the time elapsing between two such predefined events is studied. Some important issues in survival analysis were therefore reviewed with respect to the study of migration of the elite. Survival analysis was introduced in its earliest form - traditional life table analysis. The development and limitations of the proportional hazards model were discussed; approaches to the problem of unobserved heterogeneity were reviewed; mixture models were considered; and finally, alternative observational plans were described.

The electorate of Viana was identified, described, and compared with the population from which it was drawn. Trends in the size and characteristics of the electorate were described, and log-linear models were used to compare the characteristics of the electorate in the census years of 1864 and 1878 with the population from which it was drawn. Also, an analogous analysis was performed to identify the elite - the sample of the electorate with names consisting of three or more components. The elite were found to be a slightly biased sample of the electorate, weighted in favour of residents of the parish of Santa Maria Maior during the period 1850-1878, who were unmarried, and were engaged in commerce, the armed forces, public administration, or the professions.

Migration of the elite was analysed through an examination of indirect and inferential evidence of temporary and permanent absence from Viana. Of course, the analysis is dependent on the record linkage of the muster-rolls, electoral registers, passport books, and cemetery lists. References to possible inaccuracies of the record

linkage were therefore discussed where appropriate. The retrieval of a statistical file of individual life histories from the database was described; and the restriction of the dataset was considered in the context of the circumstances under which the original manuscript sources were created. Then, several exploratory analyses of the restricted elite were described; these provide some initial insight into the generation of individual life histories, while also serving to verify the quality of the data.

Indirect evidence of migration of the elite was examined; the passport book records were used to provide estimates of emigration, stage migration, return migration and repeat migration. The analyses suggested that the level of emigration exceeded 5%. Of these emigrants, a considerable proportion (25-49%) were stage migrants; return migration was estimated to be of the order of 70-87%; and, of these return migrants, 20% later became repeat migrants.

Finally, inferential evidence of migration of the elite was examined; in particular, models of duration on the electoral registers were estimated. The analysis suggested that while out-migration (excluding emigration) was not significantly dependent on age, or marital status, there were large occupational differentials, and significant period effects.

8.3 Suggestions for Further Research

In this final Section, some suggestions are made for further research within the field in general, and with respect to the Viana Project in particular.

With respect to the study of Portuguese migration in general, the analyses presented in Chapter 3, which examined aggregate emigration data for the District of Viana during the second half of the nineteenth century, might be repeated for other districts of Portugal. This would enable comparisons to be drawn between the level and structure of emigration, and the extent of clandestine emigration from different districts.

With respect to the Viana Project in particular, there are several areas in which further research might be directed. First, considering the reconstitution of Viana do Castelo presented in Chapter 4, the record linkage strategies might be developed further. In particular, the likelihoods of different persons sharing particular component and full names might be incorporated. This would go some way towards resolving the uncertainty surrounding the record linkage of individuals with two or less component names, and the identification of return migrants. Second, further information from the four manuscript sources might be incorporated in the Viana Database; for example, information available on the electoral registers concerning taxes paid by electors might be used to examine wealth differentials among the elite. Third, other manuscript sources available for Viana might be added to the Viana Database. For example, baptism, marriage, and death registers are available for Viana; these might be used to reconstitute the whole population. Also, notarial records are available; these might be used to examine patterns of inheritance in Viana. Finally, sources available elsewhere might also be added to the Viana Database. For example, sources from Brazil might allow a detailed investigation of Viana's commercial trade links.

Also, apart from research possibilities requiring the input of more data, there are several analyses which might be performed using the current Viana Database. First, the map of the Town of Viana available for the period during which the muster-rolls were compiled (1826-1833) might be used to investigate the distribution of the population with respect to its demographic, and socioeconomic

characteristics. Second, temporary absences from the electoral registers might be examined using statistical models. Third, survival analysis techniques might be applied to the information available on the cemetery lists to examine mortality levels and differentials. Fourth, this thesis has focused on aggregate analyses of the components of migration. However, historians might learn a great deal from micro-analyses of individual life histories; for example, the process of mercantile migration could be examined in detail.

Finally, to return to the study of Portuguese migration in general, having identified the components of migration, further research might investigate more closely the impact of these components of migration on the economy and society of the Port-city of Viana do Castelo, and its hinterland.

APPENDIX 2.A

Passports Issued in Portugal 1855-1973

Year	Passports	Year	Passports	Year	Passports
1855	11,557	1895	44,746	1935	9,104
1856	10,288	1896	27,680	1936	12,484
1857	9,861	1897	21,334	1937	14,667
1858	8,963	1898	23,604	1938	13,609
1859	9,309	1899	17,774	1939	17,807
1860	6,524	1900	21,235	1940	13,226
1861	5,945	1901	20,646	1941	6,260
1862	5,674	1902	24,170	1942	2,214
1863	4,411	1903	21,611	1943	,893
1864	4,517	1904	28,304	1944	2,424
1865	4,170	1905	33,610	1945	5,938
1866	4,124	1906	38,093	1946	8,275
1867	4,805	1907	41,950	1947	12,838
1868	4,782	1908	40,145	1948	12,343
1869	6,035	1909	38,223	1949	17,296
1870	7,310	1910	39,515	1950	21,892
1871	10,388	1911	59,661	1951	33,664
1872	17,283	1912	88,929	1952	47,018
1873	12,987	1913	77,645	1953	39,686
1874	14,834	1914	25,730	1954	41,011
1875	15,434	1915	19,314	1955	29,796
1876	11,027	1916	24,897	1956	27,017
1877	11,054	1917	15,825	1957	35,356
1878	9,925	1918	11,853	1958	34,030
1879	13,207	1919	37,138	1959	33,458
1880	12,596	1920	64,783	1960	32,318
1881	14,635	1921	24,597	1961	33,526
1882	18,272	1922	39,795	1962	33,539
1883	19,251	1923	40,171	1963	39,519
1884	17,518	1924	29,710	1964	55,646
1885	15,004	1925	22,884	1965	89,056
1886	13,998	1926	42,067	1966	120,239
1887	16,932	1927	27,674	1967	92,502
1888	23,981	1928	34,297	1968	-
1889	29,421	1929	40,361	1969	70,165
1890	20,614	1930	23,196	1970	66,360
1891	23,585	1931	6,033	1971	50,400
1892	21,074	1932	5,909	1972	54,084
1893	30,383	1933	8,905	1973	79,588
1894	26,911	1934	7,472		

Source: Serrão (1974:30-32).

APPENDIX 2.B

Brazilian Immigration of Portuguese, 1819-1947

Year	Passports	Year	Passports	Year	Passports
1835	-	1875	3,692	1915	15,118
1836	-	1876	7,421	1916	11,981
1837	120	1877	7,965	1917	6,817
1838	-	1878	6,236	1918	7,981
1839	141	1879	8,841	1919	17,068
1840	206	1880	12,101	1920	33,883
1841	159	1881	3,144	1921	19,981
1842	48	1882	10,621	1922	28,622
1843	-	1883	12,509	1923	31,866
1844	-	1884	8,683	1924	23,267
1845	-	1885	7,611	1925	21,508
1846	-	1886	6,287	1926	38,791
1847	78	1887	10,216	1927	31,236
1848	-	1888	18,289	1928	33,882
1849	-	1889	15,240	1929	38,879
1850	178	1890	21,174	1930	18,740
1851	53	1891	32,349	1931	8,152
1852	231	1892	17,797	1932	8,499
1853	8,329	1893	28,986	1933	10,696
1854	7,384	1894	17,042	1934	8,732
1855	9,839	1895	36,055	1935	9,327
1856	9,159	1896	22,299	1936	4,626
1857	9,430	1897	13,558	1937	11,417
1858	9,327	1898	15,105	1938	7,435
1859	9,342	1899	10,989	1939	15,120
1860	5,914	1900	8,250	1940	11,737
1861	6,460	1901	11,261	1941	5,777
1862	5,625	1902	11,606	1942	1,317
1863	4,420	1903	11,378	1943	146
1864	5,097	1904	17,318	1944	419
1865	5,748	1905	20,181	1945	1,474
1866	4,724	1906	21,706	1946	8,149
1867	4,822	1907	29,681	1947	9,066
1868	4,425	1908	37,628		
1869	6,347	1909	30,577		
1870	4,458	1910	30,857		
1871	8,124	1911	47,493		
1872	12,913	1912	76,530		
1873	1,310	1913	76,701		
1874	6,644	1914	27,935		

Notes: See Neiva and Carneiro (1950:61-65).
Source: Neiva & Carneiro (1950).

APPENDIX 3.A

Maize Prices in Viana, 1811-1900

Year	\<Month\> 1	2	3	4	5	6	7	8	9	10	11	12	Total	N	Mean
1811	840	-	-	-	-	960	-	-	-	-	700	-	2,500	3	833
1812	700	-	-	-	-	-	-	-	-	-	-	-	700	1	700
1813	-	-	-	-	700	600	550	-	-	-	-	-	1,850	3	616
1814	-	-	-	-	680	650	-	-	-	-	-	-	1,330	2	665
1815	700	-	-	-	-	-	-	-	-	-	-	-	700	1	700
1816	520	-	-	-	-	-	-	-	-	-	-	-	520	1	520
1817	780	-	-	800	-	-	-	-	-	-	-	-	1,580	2	790
1818	400	-	-	900	1000	900	-	-	-	550	-	-	3,750	5	750
1819	-	450	420	420	-	-	-	-	-	-	-	320	1,610	4	402
1820	280	260	-	280	240	240	-	220	-	240	-	-	1,760	7	251
1821	-	-	300	280	280	260	-	280	240	240	-	-	1,880	7	268
1822	-	-	280	290	300	280	300	320	-	400	-	330	2,500	8	312
1823	360	-	-	400	440	380	-	340	-	400	-	-	2,320	6	386
1824	400	440	-	-	-	-	480	-	-	-	-	-	1,320	3	440
1825	-	500	520	440	540	440	530	500	480	440	-	-	4,390	9	487
1826	440	-	-	-	420	420	-	360	400	460	440	-	2,970	7	424
1827	-	-	540	520	500	-	-	-	-	-	440	-	2,000	4	500
1828	-	-	-	-	-	420	480	320	-	-	-	260	1,480	4	370
1829	260	-	-	-	-	280	240	240	320	280	290	260	2,170	8	271
1830	270	300	300	300	320	280	240	240	240	320	290	260	3,650	12	304
1831	260	260	260	240	290	320	320	280	280	300	-	260	3,070	11	279
1832	290	300	400	400	420	320	320	300	300	300	320	-	3,670	11	333
1833	270	270	280	260	200	240	200	200	260	270	270	200	2,680	12	223
1834	190	210	200	240	250	-	-	-	-	-	-	-	1,090	5	218
1838	-	-	-	-	-	-	200	220	220	250	270	260	1,420	6	236
1839	-	260	260	240	240	250	270	300	300	300	340	360	3,120	11	283

Year	Month 1	2	3	4	5	6	7	8	9	10	11	12	Total	N	Mean
1840	360	370	460	-	530	550	620	480	380	380	380	400	4,910	11	446
1841	400	400	420	440	440	370	380	410	420	410	390	390	4,870	12	405
1842	400	410	380	410	390	390	400	390	360	340	320	310	4,500	12	375
1843	300	290	300	400	380	380	560	540	388	295	320	294	4,447	12	370
1844	315	470	330	323	290	276	232	230	230	245	246	215	3,402	12	283
1845	227	227	220	255	252	195	245	264	222	230	213	225	2,775	12	231
1846	238	262	268	250	267	240	225	238	245	290	298	318	3,138	12	261
1847	367	505	505	430	435	420	352	365	343	376	375	360	4,832	12	402
1848	362	365	351	344	308	300	319	308	299	310	308	276	3,848	12	320
1849	263	243	268	275	290	292	300	276	254	243	238	240	3,181	12	265
1850	255	255	248	250	258	304	303	304	260	265	280	295	3,276	12	273
1851	333	295	300	325	440	350	280	416	332	350	336	335	4,092	12	340
1852	370	366	363	363	332	316	285	318	338	284	297	300	3,931	12	327
1853	332	360	348	332	303	360	362	330	318	342	365	356	4,107	12	342
1854	388	420	433	434	428	440	502	520	466	510	540	598	5,678	12	473
1855	613	680	680	680	720	764	788	620	516	395	370	428	7,253	12	604
1856	420	380	380	365	384	453	503	496	370	378	438	548	5,113	12	426
1857	516	535	535	520	528	508	508	540	483	446	443	420	5,980	12	498
1858	412	393	365	338	324	373	444	438	410	432	427	440	4,794	12	399
1859	456	480	489	488	555	550	508	420	360	368	385	366	5,425	12	452
1860	370	365	388	405	400	344	313	345	338	375	398	418	4,458	12	371
1861	405	403	414	393	373	340	325	324	350	363	377	368	4,433	12	369
1862	353	333	348	353	374	390	495	544	505	430	426	425	4,975	12	414
1863	458	465	508	515	528	513	510	496	480	504	495	505	5,976	12	498
1864	516	515	505	508	495	473	500	495	485	498	495	492	5,977	12	498
1865	503	512	505	514	530	560	568	522	436	437	400	343	5,829	12	485
1866	388	380	376	373	355	344	351	345	362	420	393	410	4,496	12	374
1867	291	393	404	413	420	438	413	448	422	413	446	450	4,949	12	412
1868	448	458	505	548	526	505	525	425	415	468	442	453	5,716	12	476
1869	444	445	435	423	413	413	394	400	395	372	365	389	4,886	12	407

Year	\	\	\	\	\	Month	\	\	\	\	\	\			
	1	2	3	4	5	6	7	8	9	10	11	12	Total	N	Mean
1870	355	360	355	348	353	405	454	443	430	442	460	546	4,950	12	412
1871	528	550	430	572	565	565	634	600	444	415	420	400	6,123	12	510
1872	420	415	405	403	410	414	420	408	370	375	373	380	4,792	12	399
1873	392	220	220	221	228	220	210	226	220	220	212	212	2,802	12	233
1874	222	233	235	230	230	230	230	230	230	235	270	238	2,813	12	234
1875	270	270	273	280	270	334	313	315	318	462	372	323	3,800	12	316
1876	328	367	346	458	355	346	347	339	289	272	233	247	3,926	12	327
1877	271	254	254	280	280	280	255	231	231	231	231	231	3,029	12	252
1878	248	240	238	239	249	270	254	-	-	-	-	-	1,737	7	248
1880	265	277	271	254	271	267	256	254	242	225	227	221	3,031	12	252
1881	226	239	247	239	245	242	242	242	240	254	260	260	2,936	12	244
1882	254	265	287	289	339	358	363	383	306	300	300	300	3,744	12	311
1883	302	308	312	309	319	355	335	323	323	323	346	346	3,902	12	325
1884	346	323	323	323	323	329	329	329	316	252	242	289	3,723	12	310
1885	300	266	254	254	261	254	249	214	219	219	231	226	2,947	12	245
1886	219	208	225	210	219	219	210	208	208	208	231	208	2,573	12	214
1887	208	208	208	208	234	254	279	263	219	260	254	254	2,848	12	237
1888	289	289	312	323	305	277	315	335	259	277	265	242	3,487	12	290
1889	259	271	254	254	265	242	242	242	219	242	242	254	2,986	12	248
1890	254	264	254	265	265	265	300	358	300	-	300	312	3,137	11	285
1891	317	313	313	381	381	326	335	346	363	300	289	462	4,126	12	343
1892	265	265	284	312	312	275	231	231	221	231	219	229	3,075	12	256
1893	231	231	231	-	-	-	-	-	289	-	-	-	982	4	245
1894	254	265	265	265	300	300	369	369	323	312	300	289	3,611	12	300
1895	312	312	323	323	353	323	360	360	260	265	254	254	3,699	12	308
1897	274	268	265	265	465	242	242	277	274	265	265	248	3,350	12	279
1898	248	248	248	248	289	289	239	323	346	342	346	296	3,462	12	288
1899	346	346	335	342	346	319	319	350	317	317	317	323	3,980	12	331
1900	335	335	335	335	393	393	393	393	265	312	312	312	4,066	12	338

Source: **Actas da Câmara, Archivo Municipal de Viana do Castelo.**

APPENDIX 3.B

Demographic Statistics of the District of Viana, 1837-1890

Year	House-holds	Population		Births		Deaths		Marr-iages
		Male	Female	Male	Female	Male	Female	
1837	44,344	80,509	99,388	2,596	2,427	1,534	1,635	1,196
1838	43,742	78,633	93,012	2,614	2,554	1,140	1,333	1,060
1839	43,904	77,984	91,792	2,510	2,328	1,066	1,240	1,038
1840	44,116	81,955	94,901	2,468	2,360	1,285	1,384	985
1841	44,602	82,005	94,982	2,695	2,439	1,353	1,625	914
1842	44,693	83,992	96,863	2,521	2,727	1,489	1,612	888
1843	44,887	83,089	96,235	2,563	2,446	1,321	1,587	880
1844	44,924	83,791	97,004	2,539	2,374	1,333	1,495	902
1845	45,378	(188,637)		(5,059)		(3,012)		1,356
1846	45,810	82,903	97,057	2,613	2,382	1,341	1,494	928
1847	45,483	82,874	97,274	2,457	2,355	1,424	1,567	940
1848	46,448	83,771	98,065	2,646	2,578	1,462	1,592	1,175
1849	46,495	85,429	99,609	2,714	2,597	1,413	1,658	1,103
1850	47,130	86,673	101,118	2,587	2,541	1,385	1,613	1,161
1851	47,241	85,555	98,804	2,562	2,527	1,808	1,895	1,057
1852	47,227	86,565	99,290	2,843	2,777	1,606	1,699	1,128
1853	48,051	87,280	101,231	2,663	2,685	2,026	2,150	973
1854	48,133	86,995	101,672	2,569	2,497	1,642	1,815	1,041
1855	48,368	87,466	101,982	2,640	2,515	1,831	2,064	927
1856	48,178	87,977	102,687	2,655	2,455	1,695	1,867	1,090
1857	48,851	88,320	103,150	2,422	2,497	1,718	2,037	1,125
1858	48,835	88,134	102,663	2,760	2,555	1,709	1,893	1,246
1859	48,461	89,070	103,920	2,765	2,621	1,745	1,829	1,153
1860	48,052	89,388	105,189	2,549	2,457	1,628	1,843	1,074
1861	48,989	91,391	107,546	2,633	2,497	1,630	1,852	1,231
1862	50,144	92,786	108,613	2,707	2,716	1,858	2,007	1,141

Year	House-holds	Population Male	Population Female	Births Male	Births Female	Deaths Male	Deaths Female	Marr-iages
1863	-	(204,579)		2,821	2,711	-	-	-
1864	52,540	93,258	109,424	2,664	2,634	2,005	1,969	1,192
1865	52,817	93,857	110,418	2,579	2,593	1,957	2,121	1,183
1866	53,164	94,408	111,865	2,823	2,734	1,871	2,194	1,294
1867	53,538	95,174	111,487	2,836	2,688	1,857	2,020	1,157
1868	-	-	-	-	-	-	-	-
1869	55,262	95,719	111,775	2,873	2,702	2,029	2,170	1,212
1870	55,773	96,353	113,143	2,601	2,592	1,945	2,114	1,243
1871	55,984	96,999	112,865	2,805	2,677	1,649	1,887	1,263
1872	55,940	96,196	112,072	2,798	2,740	2,015	2,198	1,115
1873	56,202	97,175	112,670	2,690	2,513	2,195	2,361	1,208
1874	56,512	97,298	112,990	3,170	2,882	2,111	2,277	1,240
1875	57,213	97,957	113,726	2,925	2,794	1,828	1,981	1,194
1876	57,148	98,361	114,275	2,796	2,759	2,107	2,378	1,260
1877	-	(212,580)		-	-	-	-	-
1878	55,660	98,379	112,468	2,880	2,600	1,929	2,102	1,382
1879	56,056	98,202	113,594	2,901	2,645	2,063	2,326	1,245
1880	56,273	97,242	113,434	2,886	2,698	2,137	2,327	1,237
1881	56,027	98,803	113,498	3,005	2,737	1,974	2,132	1,252
1882	56,305	98,466	113,881	2,956	2,703	1,821	1,946	1,229
1883	56,478	97,908	113,546	2,893	2,771	1,910	2,055	1,278
1884	57,081	98,265	114,424	2,872	2,813	1,909	2,000	1,179
1885	56,579	98,335	113,364	3,036	2,842	1,865	1,925	1,252
1886	56,788	100,535	114,504	3,162	2,949	1,813	1,865	1,267
1887	57,244	99,542	115,794	3,046	2,899	1,908	2,069	1,219
1888	57,217	97,106	115,024	3,096	2,962	1,713	2,069	1,302
1889	57,444	98,761	116,477	3,231	3,006	1,904	1,823	1,158
1890	56,951	99,762	117,583	2,924	2,757	1,910	2,057	1,229

Source: Estatísticas da População do Distrito de Vianna do Castello (1837-1867; 1869-1890).

APPENDIX 3.C

Passports Issued in all Portugal (1),

the District of Viana (2), and

the Town/City of Viana (3),

1835-1935

Year	(1)	(2)	(3)	Year	(1)	(2)	(3)	Year	(1)	(2)
1835	-	10	4	1870	4458	450	20	1905	20181	892
1836	-	68	29	1871	8124	790	48	1906	21706	947
1837	-	162	35	1872	12918	1099	38	1907	29681	922
1838	-	25	6	1873	1310	1134	31	1908	37628	950
1839	-	66	18	1874	6644	1425	20	1909	30577	1041
1840	-	98	20	1875	3692	1469	48	1910	30857	1441
1841	-	69	14	1876	7421	610	26	1911	47493	1812
1842	-	158	39	1877	7965	385	25	1912	76530	2487
1843	-	64	13	1878	6236	440	29	1913	76701	2219
1844	-	43	13	1879	8841	580	23	1914	27935	845
1845	-	77	12	1880	12101	521	21	1915	15118	401
1846	-	28	8	1881	3144	682	28	1916	11981	473
1847	-	27	10	1882	10621	835	50	1917	6817	254
1848	-	14	5	1883	12509	706	31	1918	7981	331
1849	-	43	14	1884	3683	612	34	1919	17068	957
1850	-	120	24	1885	7611	399	22	1920	33833	2276
1851	-	76	13	1886	6287	484	29	1921	19981	1014
1852	-	0	0	1887	10216	671	26	1922	28622	1496
1853	-	37	4	1888	18289	842	27	1923	31866	1677
1854	-	156	20	1889	15240	735	26	1924	23267	1408
1855	9839	153	16	1890	21174	813	34	1925	21508	954
1856	9159	180	22	1891	32349	1071	49	1926	38791	1821
1857	9430	409	38	1892	17797	647	40	1927	31236	992
1858	9327	306	17	1893	28986	870	32	1928	33882	1258
1859	9342	345	29	1894	17042	789	44	1929	38879	1555
1860	5914	230	21	1895	36055	1131	59	1930	18740	829
1861	6460	299	26	1896	22299	798		1931	8152	200
1862	5625	283	29	1897	13558	661		1932	8499	240
1863	4420	327	23	1898	15105	808		1933	10696	380
1864	5097	297	11	1899	10989	734		1934	8732	234
1865	5784	205	17	1900	8250	693		1935	9327	135
1866	4724	271	15	1901	11261	509				
1867	4822	283	16	1902	11606	547				
1868	4425	328	41	1903	11378	658				
1869	6347	388	21	1904	17318	813				

Note: The figures for the District, 1872-1876, include the passports
issued to Galicians: 59, 427, 766, 702, and 141, respectively.
Sources: (1) Serrão (1974:30-32)
(2) and (3): Passport Books, Viana do Castelo.

APPENDIX 3.D

Example Steamship-Passage Advertisements

MALA REAL

INGLEZA

(Incorporada por carta real em 1839)
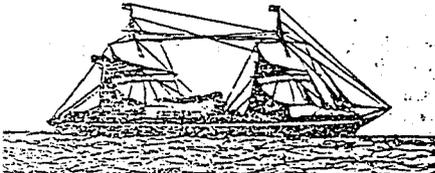
A companhia mais antiga de

Paquetes a vapor entre Lisboa, portos do Brazil e Rio da Prata

As sahidas dos paquetes de Lisboa são agora (salvo caso de força maior) ás segundas feiras, de quinze em quinze dias, em vez de 13 e 28, como antigamente.

Alternadamente tocará em dos vapores em : PERNAMBUCO, MACEIÓ, BAHIA, RIO DE JANEIRO, SANTOS, MONTEVIDEU e BUENOS-AYRES, e outro em : S. VICENTE, PERNAMBUCO, BAHIA, RIO DE JANEIRO, MONTEVIDEU e BUENOS-AYRES.

Tambem se acceitam passageiros com trasbordo para muitos outros pontos, tanto no littoral como no interior do Brazil.

MAGDALENA, em 9 de dezembro

De Lisboa para os portos de S. Vicente, Pernambuco, Bahia, Rio de Janeiro, Montevideu e Buenos-Ayres.

Os paquetes d'esta companhia são : — Tagus, La Plata, Elbe, Nile, Neva, Tamar e Trent.

Agentes no Porto, *William & Geo Tait*, rua dos Inglezes, 23. — Unico correspondente em Vianno do Castello — *Francisco José de Araujo Junior*, run de D. Luiz. (315)

BOOTH STEAMSHIP COMPANY

EM COMBINAÇÃO COM

RED CROSS LINE MAIL STEAMERS

As mais antigas linhas de paquetes a vapor para os portos do norte do Brazil

Do Porto para o Pará e Ceará

DIRECTAMENTE

Recebendo tambem carga e passageiros para MANÁOS

Carreira mensal de paquetes a vapor

GRANDE RAPIDEZ E ECONOMIA

Para carga e passageiros, para os quaes tem magnificas accommodações, ou quaesquer informações trata-se com

Os agentes
A. J. Shore & C.
57 — Rua dos Inglezes — Porto

(2123)

Source: A Aurora do Lima.

APPENDIX 4.A

Census Population of the City of Viana do Castelo by Sex and Age, 1864 and 1878

Age Group	Santa Maria Maior				Monserrate			
	Male		Female		Male		Female	
	1864	1878	1864	1878	1864	1878	1864	1878
<1	54	43	62	52	47	48	48	40
1- 5	246	228	258	204	183	197	216	173
6-10	282	248	268	222	177	153	167	152
11-15	247	239	255	229	134	145	156	153
16-20	186	233	271	245	154	108	169	192
21-25	162	303	241	280	383	111	183	183
26-30	134	216	266	282	156	101	209	174
31-35	126	189	187	177	119	82	112	124
36-40	162	157	307	259	147	74	187	162
41-45	115	101	140	152	74	57	77	96
46-50	156	137	227	233	111	81	165	140
51-55	88	97	139	102	64	61	86	70
56-60	83	124	181	183	73	84	89	109
61-65	62	71	83	75	21	39	49	62
66-70	62	44	100	112	32	38	43	56
71-75	38	29	33	42	17	17	16	22
≥76	39	40	73	82	26	29	40	43
Total	2242	2488	3091	2962	1918	1425	2012	1941

Note: Monserrate Males Aged 21-25 in 1864 is corrected to 158 by Reis (1987:262-266).

Source: Reis (1987:263).

APPENDIX 4.B.1

Example Muster-Roll

APPENDIX 4.B.2

Example Electoral Register

Nomes	Idade	Estado	Profissão	Rendimento annual líquido
Joaõ da Silva S. Miguel — 118	25	Solteiro	Mercador	100$000
Joaquim Alves	40	Cazado	Sabuneiro	100$000
Joaquim Corrêa — 120	55	Solteiro	Idem	200$000
Joaquim da Costa Barboza	65	Cazado	Proprietario	100$000
Joaquim Fernandes Bandeira	50	Viuvo	Alfayate	100$000
Joaquim Gonçalves de Sá	44	Cazado	Tutor	100$000
Joaquim Jozé d'Amorim	50	Solteiro	Alfayate	100$000
Joaquim Jozé d'Azevedo	50	Viuvo	Carpinteiro	100$000
Joaquim Jozé Bandeira	45	Cazado	Proprietario	200$000
Joaquim Jozé Viana	45	Idem	Barbeiro	
Jozé Antonio Gonçalves	36	Idem	Ferrador	100$000
Jozé Antonio e Mattos Lima	49	Idem	Mr d'Hiate	100$000
Jozé Antonio da Silva Rollo — 130	43	Idem	Marinha de Provisão	100$000
Jezé Antonio Vieira d'Araujo Lima	55	Idem	Mercieiro	100$000
Jozé Baptista da Silva Roça	70	"	Presbytero	100$000
Jozé Caetano da Costa Corrêa	60	Cazado	Proprietario	200$000
Jozé Cerqueira	50	Idem	Contratador de Sollei	100$000
Jozé da Costa Amorim	43	Idem	Escrivaõ da comiçaõ	100$000
Jozé da Cunha Neves	44	Idem	Ferrador	100$000
Jozé Custodio	39	Solteiro	Mercieiro	100$000
Jozé Domingues das Pereiras	36	Cazado	Proprietario	100$000
Jozé Francisco d'Azevedo	36	Idem	Carpinteiro	100$000
Jozé Francisco Couto — 140	37	Idem	Idem	100$000
Jozé Francisco d'Oliveira	62	Idem	Saŭ Christaõ	100$000
Jozé Fernandes Guerreiro	38	Idem	Capelista	100$000
Jozé Gomes Brak Lamy	60	Idem	Medico	400$000
Jozé Joaquim Estaul	53	Idem	Proprietario	200$000
Jozé Lopes Bandeira	36	Idem	Surrador	100$000
Jozé Luiz Pinto — 146	61	Viuvo	Foguetero	100$000

APPENDIX 4.B.3

Example Passport Book

3 856 0005

GOVERNO CIVIL

DE

VIANNA DO CASTELLO

1.ᴬ REPARTIÇÃO

Passaporte do exteri-
or

N.º *838*

Siguaes

Idade *14* annos

Altura *Baixo*

Rosto *Redondo*

Cabello *castanho*

So'brolhos

Olhos

Nariz

Boca

Côr

Siguaes particulares

O GOVERNO CIVIL DO DISTRICTO

DE

VIANNA DO CASTELLO

CONCEDE passaporte a

filho de

natural de

residente em

de profissão ---

para

levando em sua companhia

abonado por

E cumprindo com a obrigação &c.

Valeoso por tempo de *60* dias para sahir destes Reinos

Dado em Vianna aos *7* de *Março* de 185

O *Governador Civil*

Portador

Assignatura do { Fiador

Dito

APPENDIX 4.B.4

Example Cemetery List

4 878 0050

50

60

70

80

83

APPENDIX 4.C

Data Recorded on the Electoral Registers

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1834	x	x	x	x	-	x	x	x	1	x	x	-	-	-	A-
1835	x	x	x	x	-	x	x	x	1	x	x	-	-	-	A-
1836	x	x	x	x	-	x	x	x	1	x	x	-	-	-	A-
1837	x	-	-	-	-	-	-	-	-	-	-	-	-	-	A-
1838	x	-	-	-	-	-	-	-	-	-	-	-	-	-	A-
1839	x	-	-	-	-	-	-	-	-	-	-	-	-	-	A-
1840	x	x	-	x	-	-	x	-	4	-	-	-	-	-	B-
1841	x	x	-	x	-	-	x	-	4	-	-	-	-	-	A-
1842	x	x	x	x	x	-	x	-	4	-	-	-	-	-	B-
1843	x	x	x	x	x	-	x	-	7	-	-	-	-	-	C-
1844	x	x	x	x	x	-	x	-	5	-	-	-	-	-	C-
1845	x	x	x	x	-	-	x	-	4	-	-	-	-	-	C-
1846	x	x	x	x	-	-	x	-	4	-	-	-	-	-	C-
1847	x	x	x	x	-	-	x	-	4	-	-	-	-	-	B-
1848	x	x	x	x	-	-	x	-	4	-	-	-	-	-	B-
1849	x	x	x	x	-	-	x	-	4	-	-	-	-	-	B-
1850	x	x	x	x	-	-	x	-	4	-	-	-	-	-	A-
1851	x	x	x	x	-	-	x	-	4	-	-	-	-	-	C-
1852	x	x	x	x	x	-	x	-	6	-	x	-	-	-	B-
1853	x	x	x	x	-	x	x	-	4	-	x	x	-	-	B-
1854	x	x	x	x	-	x	-	-	4	x	-	x	-	-	A-
1855	x	x	x	x	-	x	-	-	4	x	x	x	-	-	B-
1856	x	x	x	x	-	x	-	-	5	x	x	x	-	-	B-
1857	x	x	x	x	-	x	-	-	5	x	x	x	x	-	B-
1858	x	x	x	x	-	x	-	-	5	x	x	x	x	-	B-
1859	x	x	x	x	-	x	-	-	5	x	x	x	x	-	A-
1860	x	x	x	x	-	x	-	-	5	x	x	x	x	-	B-
1861	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1862	x	x	x	x	-	x	-	-	5	x	x	x	x	-	A-
1863	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1864	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1865	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1866	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1867	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1868	x	x	x	x	-	x	-	-	5	x	x	x	x	x	A-
1869	x	x	x	x	-	x	-	-	5	x	x	x	x	x	B-
									5	x	x	x	x	x	A-

| Year | Variable |
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1870	x	x	x	x	-	x	-	-	5	x	x	x	-	x	A-
1871	x	x	x	x	-	x	-	-	5	x	x	x	-	x	AU
1872	x	x	x	x	-	x	-	-	5	x	x	x	-	x	B-
1873	x	x	x	x	-	x	-	-	5	x	x	x	-	x	BU
1874	x	x	x	x	-	x	-	-	5	x	x	x	-	x	BU
1875	x	x	x	x	-	x	-	-	5	x	x	x	-	x	AU
1876	x	x	x	x	-	x	-	-	5	x	x	x	-	x	BU
1877	x	x	x	x	-	x	-	-	5	x	x	x	-	x	BU
1878	x	x	x	x	-	x	-	-	5	x	x	x	-	x	A-
::::															
1880	x	x	x	x	-	x	-	-	2	x	-	-	-	-	B-
1881	x	x	x	x	-	x	-	-	2	x	-	-	-	-	AU
::::															
1883	x	x	x	x	-	x	-	-	2	x	-	-	-	-	B-
::::															
1888	x	x	x	x	-	x	-	-	-	x	-	-	-	-	A-
::::															
1891	x	x	x	x	-	x	-	-	-	x	-	-	-	-	A-
::::															
1894	x	x	x	x	-	x	-	-	-	-	-	-	-	-	A-
1895	x	x	x	x	-	x	-	-	1	-	-	-	-	-	A-
::::															
1911	x	x	x	x	-	x	-	-	-	-	-	-	-	-	A-
::::															
1931	x	x	x	x	-	-	-	-	-	-	-	-	-	-	A-

(an x denotes that the information was recorded)

Key:

Variable	Description
1	Name
2	Age in Years
3	Marital Status
4	Occupation
5	Birthplace
6	Road of Residence
7	Literacy
8	Household Head
9	Number of Tax Categories Recorded
10	Social Qualifications
11	Observations
12	Eligible for Election
13	Eligible for Jury Service
14	Major Contributor (one of the 40 highest taxpayers)

The final column (15) provides an indication of the quality of the document (A, B, or C) and whether it appears to be an update of the previous electoral register (U).

APPENDIX 7.A

The Electorate of Viana, 1834-1931

Year	Santa Maria Maior			Monserrate		
	(1)	(3)	(1)+(3)	(2)	(4)	(2)+(4)
1834	214	-	214	80	-	80
1835	187	-	187	77	-	77
1836	238	-	238	79	-	79
1837	257	-	257	106	-	106
1838	291	-	291	340	-	340
1839	237	-	237	112	-	112
1840	414	-	414	178	-	178
1841	414	-	414	176	-	176
1842	320	-	320	170	-	170
1843	314	-	314	112	68	180
1844	325	-	325	118	70	188
1845	420	-	420	170	88	258
1846	341	-	341	125	-	125
1847	358	-	358	126	-	126
1848	283	-	283	119	-	119
1849	363	-	363	152	65	217
1850	350	-	350	148	52	200
1851	433	-	433	202	64	266
1852	304	-	304	143	73	216
1853	382	-	382	175	65	240
1854	364	-	364	169	65	234
1855	352	-	352	165	61	226
1856	344	-	344	158	111	259
1857	321	-	321	150	96	246
1858	352	-	352	155	93	248
1859	344	-	344	156	101	257
1860	375	-	375	175	90	265
1861	371	-	371	174	85	259
1862	393	-	393	186	79	265
1863	494	-	494	225	84	309
1864	458	-	458	213	85	298
1865	455	-	455	200	76	276
1866	445	28	473	198	67	265
1867	469	33	502	224	71	295
1868	490	37	527	219	76	295
1869	476	31	506	197	51	248

Key: (1) Permanent residents of Santa Maria Maior
(3) Employees of the customhouse
(2) Permanent residents of Monserrate
(4) Stationed in military garrison

Year	Santa Maria Maior			Monserrate		
	(1)	(3)	(1)+(3)	(2)	(4)	(2)+(4)
1870	478	24	502	196	49	245
1871	466	36	502	191	45	236
1872	541	44	585	216	50	266
1873	503	44	547	214	64	278
1874	499	48	547	229	20	249
1875	487	48	535	229	24	253
1876	485	49	534	229	27	256
1877	492	53	545	241	22	263
1878	513	51	564	307	35	342
::::	:::	:	:::	:::	:	:::
1880	749	-	749	522	-	522
1881	725	-	725	536	-	536
::::	:::	:	:::	:::	:	:::
1883	831	-	831	540	-	540
::::	:::	:	:::	:::	:	:::
1888	731	-	731	492	-	492
::::	:::	:	:::	:::	:	:::
1891	816	-	816	464	-	464
::::	:::	:	:::	:::	:	:::
1894	493	-	493	285	-	285
1895	386	-	386	235	-	235
::::	:::	:	:::	:::	:	:::
1911	734	-	734	846	-	846
::::	:::	:	:::	:::	:	:::
1931	767	-	767	653	-	653

Key: (1) Permanent residents of Santa Maria Maior
(3) Employees of the customhouse
(2) Permanent residents of Monserrate
(4) Stationed in military garrison

APPENDIX 7.B

The Statistical File of Life History Data

Record Number	Variable	Columns
	Case Number	1- 5
	Record Number	7
1	CID	9-16
1	ETY	17-20
1	MAP	21-24
1	EAP	25-28
1	EAB	29-32
1	PAP	33-36
1	CAP	37-40
1	FEY	41-44
1	LEY	45-48
1	YEX	49-52
1	MEX	53-56
1	MIN	57-60
1	MAN	61-64
1	EPB	65-68
1	EYB	69-72
1	PRP	73-76
1	CLR	77-80
2	PRC1	8-11
2	PRY2	12-15
2	PRC2	16-19
2	PRY3	20-20
2	PRC3	24-27
2	ELY1-54	29-82
3	PPI1	9-11
3	PDT1	13-14
3	PDR1	16-16
3	PYR1	17-19
:	: : : :	: : : : :
3	PPI6	69-71
3	PDT6	73-74
3	PDR6	76-76
3	PYR6	77-79
4	OFC1	8-11
4	OFY2	12-15
4	OFC2	16-19
4	OFY3	20-23
4	OFC3	24-27
4	OSC1	32-35
4	OSY2	36-39
4	OSC2	40-43
4	OSY3	44-47
4	OSC3	48-51
5	MSC1	8-11
5	MSY2	12-15
5	MSC2	16-19
5	MSY3	20-23
5	MSC3	24-27
5	MSY4	28-31
5	MSC4	32-35

Variable	Description
CID	The database NID of the first record of this individual.
ETY	Initial entry on electoral registers as: (1) Permanent resident of Santa Maria Maior (2) Employees of the customhouse (3) Permanent resident of Monserrate (4) Stationed in military garrison
MAP	Number of muster-roll records.
EAP	Number of electoral register records.
EAB	Number of absences from the electoral registers.
PAP	Number of passport book records.
CAP	Number of cemetery list records.
FEY	Year of first entry on electoral registers (e.g. 834).
LEY	Year of last entry on electoral registers (e.g. 931).
YEX	Year of exit from the elite (e.g. 922).
MIN	Minimum number of component names recorded.
MAN	Maximum number of component names recorded.
EBP	Estimated birthplace code: (0) Unknown (1) Santa Maria Maior (2) Monserrate (3) Viana do Castelo (Town/City) (4) Viana (Borough) (5) Viana (District) (6) Braga District (7) Elsewhere in Portugal (8) Elsewhere
EYB	Estimated year of birth (e.g. 789).
PRP	Whether ever recorded with occupation **Proprietário**.
CLR	Whether a member of the clergy.
PRC	Parish of electoral registration code: (1) Santa Maria Maior (2) Monserrate
PRY	Year in which next PRC becomes valid.
ELY1- ELY54	Indicator variables denoting appearance on, or absence from each electoral register

Variable	Description
PYI	Year in which a passport was issued.
PDT	Destination declared on passport:

       (0) Unknown
       (10) Europe
       (11) Portugal
       (12) Spain
       (13) Gibralter
       (14) France
       (15) Italy
       (16) England
       (17) Switzerland
       (20) Africa
       (21) Angola
       (22) Mozambique
       (30) America
       (35) Brazil
       (36) Argentina
       (37) Chile
       (38) Montevideo
       (41) India

Variable	Description
PDR	Document of reappearance in the elite.
PYR	Year of reappearance in the elite.

OFC	Occupation function code:

       (0) Unknown
       (1) Agriculture
       (2) Hunting & Fishing
       (3) Mining
       (4) Industry & Trades
       (5) Maritime
       (6) Commerce
       (7) Armed Forces
       (8) Public Administration
       (9) Professions

OFY	Year in which next OFC becomes valid.

OSC	Economic sector code:

       (0) Unknown
       (1) Primary
       (2) Secondary
       (3) Tertiary
       (4) Unproductive

OSY	Year in which next OSC becomes valid.

MSC	Marital status code:

       (0) Unknown
       (1) Single
       (2) Married
       (3) Widowed
       (5) Divorced

MSY	Year in which next MSC becomes valid.

GLOSSARY

This glossary contains Portuguese words which appear in the preceding text.

amanuense - amanuensis
arcos - arches

bairro - suburban area
brasileiro - native born Portuguese who returns from Brazil

caixeiro - shop clerk
câmara - municipal chamber
campo - open area
capitalista - merchant
caseiro - share-cropper
cidade - city
concelho - borough

distrito - district

engajador - emigrant contractor
escultor - sculptor

fazenda - farm, plantation
francês - native born Portuguese who returns from France
foro - rent
freguesia - parish

história - history, story

indigente - destitute
ingênuo - born a slave

jornaleiro - day-labourer, landless peasant

lampianista - public gas lamp cleaner
largo - small public square
lavrador - farmer

mercieiro - trader
mineiro - miner

negociante - merchant

pedreiro - stonemason
porteiro - porter
professor - teacher

parcéria - combination of indentured service and sharecropping
praça - market place
proprietário - proprietor

quinta - large farm

rua - road

saudade - profound melancholy and longing for something past
sertão - interior area of country

travessa - street-crossing

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