12

Unemployment, Specialization, and Collective Preferences for Social Insurance

JOHN HASSLER, JOSE V. RODRÍGUEZ MORA,
KJETIL STORESLETTEN, AND FABRIZIO ZILIBOTTI

12.1. INTRODUCTION

Two facts are the driving motivation behind this chapter. On the one hand, the average unemployment rate in Continental Europe is about twice as large as that of the US. Moreover, the duration of unemployment is substantially larger in Europe; more than 50 per cent of the unemployed in Europe have been unemployed for more than a year, while the corresponding figure for the US is a mere 10 per cent (see, for instance, Table 1 in Ljungqvist and Sargent, 1998). On the other hand, the generosity of the unemployment insurance (UI) remains substantially higher in most of Continental Europe than in the US. According to the summary measure of the OECD Data-base on Benefit Entitlements and Gross Replacement Rates, constructed as a weighted average of extent, duration and coverage of insurance for different types of workers, workers in Continental Europe enjoy government provided insurance that is more than three times higher than do workers in the US.[1]

The European unemployment problem has indeed been a major concern for economists over the last two decades, and the mainstream view suggests a positive relationship between UI and unemployment rate (see below). Against this background, exploring and trying to account for interactions between the labour-market and social insurance institutions seem imperative. In particular, one would like to understand why the US and Europe have chosen so markedly different approaches to the provision of social insurance.

[1] This finding is confirmed in Martin (1996). International comparisons of measures of replacement rates remain controversial, however. According to alternative measures, the differences are less dramatic, although in no case negligible. Nickell (1997) reports the benefit replacement ratio in the average Continental European country for the period 1989–94 to be 63.3 per cent and the benefit duration 2.1 years, whereas the corresponding measures for the US are reported to be 50 per cent and 0.5 years.

In this chapter, we argue that these differences are related to the fact that in Europe, workers tend to be less mobile and more specialized (where 'specialization' is understood to be the existence of strong comparative advantages in some sectors, professions or geographical locations), while in the US, workers are more versatile; that is, they are more willing to change profession or residence. These differences in degrees of 'versatility' between European and American workers are not necessarily due to exogenous 'cultural' differences, but are likely to arise as the result of endogenous behaviour in the acquisition of human capital. In particular, European workers are more prone to acquire specialized skills, while US workers tend to acquire relatively versatile skills. These choices are, in turn, affected by differences in institutional frameworks—little or no UI in the US, while generous UI in Europe. As a result, we observe different distributions of human capital across the Atlantic. These differences in the distributions of human capital can explain the observed differences in social insurance institutions through a standard Political Economy channel.

Thus, the differences in labour-market performance and institutions across the Atlantic can be understood by the following interlinked mechanisms: (1) on the one hand, UI is generous in Europe because European workers have, endogenously, attributes (human capital) making them more concerned about unemployment risk than US workers. Hence, European workers muster stronger political support for UI than American workers. (2) On the other hand, the existence of generous UI gives incentives to European workers to acquire more specialized human capital, associated with higher unemployment risk. American workers, faced with low UI, will instead tend to accumulate more flexible human capital featuring less risk.

The chapter is organized in the following way: Section 12.2 provides a survey on the literature of the effects of UI (taken as exogenous) on labour-market performance, and illustrates the main findings by the use of a standard search model. Section 12.3 surveys the literature by studying the reverse causality: the endogenous determination of UI, taking the labour market as exogenous. In Section 12.4, we study how these two directions of causality interact and can give rise to multiple steady-states, accounting for the differences between the US and Europe. Finally, Section 12.5 presents a simple analytical model capturing the main essence of our arguments and Section 12.6 concludes.

12.2. IMPACT OF UI ON THE LABOUR MARKET

Unemployment insurance is an institution which, according to economic theory, affects the labour-market performance in a variety of dimensions. In particular, it increases the aggregate unemployment rate and compresses the earning distribution. In Appendix, we show these effects to be the outcomes of standard search models.

As argued in the introduction, UI is substantially more generous in Europe than in the US. On the other hand, wage inequality is substantially higher in the US than in Europe. For instance, Freeman (1996) reports, that in Western Europe, a

male worker in the bottom 10 per cent of the earning distribution earns 68 per cent of the median worker's income, whereas in the US, the corresponding figure is 38 per cent. In absolute terms, low-paid workers in Germany earn 2.2 times more than low-paid workers in the US. An interesting fact, consistent with the simple search model presented in Appendix (where workers are *ex ante* identical), is that a large part of US earnings inequality is between observationally equivalent workers, i.e., workers of equal age, experience, gender, education, etc. (see Gottschalk, 1997; Levy and Murnane, 1992).

Given these observations, it would be tempting to relate the evidence that unemployment (especially long-term unemployment) is higher in Europe, while wage inequality is higher in the US, to differences in the regimes of UI. This conclusion encounters an objection, however. UI—and, more in general, welfare state institutions—were more generous in Europe than in the US already during the late 60s and early 70s, and, yet, the unemployment rate was lower in Europe than in the US at the time. Some recent papers have addressed this objection, arguing that, due to the nature of technological change in the last quarter of the century, the labour-market performance has become much more sensitive to pre-existing welfare state institutions (Ljungqvist and Sargent, 1998; Marimon and Zilibotti, 1999; Mortensen and Pissarides, 1999).

In Appendix, we illustrate how these observations are indeed consistent with the simple search model in, once skill-biased technological change is added to the framework, which illustrates the key mechanisms in Marimon and Zilibotti (1999) (MZ) and Mortensen and Pissarides (1999). In particular, MZ calibrate their model and show that it can mimic salient features of the US and European labour markets in the last twenty years.[2] For instance, the two economies would, in the early 70s, start with similar unemployment rates (4 per cent in the US and 5.5 per cent in Europe). Then, after the shock, the economies would reach two new steady-states, such that the unemployment rate is almost unchanged in the laissez-faire economy, and twice as high as before the shock in the welfare state economy. The average duration of unemployment is also predicted to double in Europe, where about 30 per cent of the workers would experience an unemployment duration of more than 12 months. Wage inequality increases more in the laissez-faire than in the welfare state economy. An interesting feature is that, despite the higher unemployment, total output growth is very similar in the two economies. This is due to the fact that in the laissez-faire economy, there is higher employment, but also more mismatch, i.e., many workers are employed in activities where they do not have their comparative advantage.

An interesting implication of the analysis is that even though, in the case considered by MZ, a planner maximizing a utilitarian welfare function would choose zero benefits, the majority of workers in the welfare state economy would be hurt by a reduction of the unemployment benefits. That is, the majority of

[2] In particular, MZ assume job creation to be endogenous and determined in equilibrium, rather than assuming an exogenous wage offer distribution.

workers would rationally oppose dismantling the welfare state, even if anticipating that this were to increase unemployment and taxation. The elementary mechanism behind this result is described formally in the simple model presented in Appendix. The intuition goes as follows. Assume that benefits are financed by labour income tax. When the economy is hit by the shock, workers holding a low-paid job (which is now even worse paid than earlier) realize that it becomes more attractive to move into unemployment and wait for a better opportunity. This is, however, prohibitively costly in an economy without UI (clearly, the point would be strengthened if workers were risk-averse). If generous benefits are available, however, poor workers can decide to quit their bad job and search for better opportunities. Thus, not only unemployed workers but also the 'working poor' prefer to live in a welfare state economy and will vote against removing unemployment benefits when the shock occurs. The 'rich' (well-matched) workers, instead, have more to lose from paying higher taxes and, although anticipating the possibility of becoming unemployed in the future, this event is discounted. Thus, there is, in general, a conflict of interests between different groups of workers.[3]

While MZ ignore distortions on the incentives for the unemployed to search, this is the main focus of the analysis in Ljungqvist and Sargent (1998) (LS). They make the important assumption that workers progressively acquire skills during their employment spells, and progressively lose skills during unemployment spells. Moreover, some of the skills acquired on-the-job are not general, implying that they are lost (become worthless) when the job in which a particular worker is employed is destroyed. The benefit rate is proportional to the wage obtained by a displaced worker in his last job. In this model, the extent to which UI distorts the incentives of a displaced worker to search for a new job depends on the characteristics of each displaced worker. In particular, incentives to search are most severely weakened for those workers who were earning high wages before displacement (hence with high benefits), but whose human capital was destroyed upon displacement. These workers will engage in an effortless and picky search strategy, and will not be deterred by the threat of losing skills while unemployed. Hence, their generous benefits will keep their reservation wage high. According to LS, the size of this group of workers in the labour force has increased substantially since the late 70s. If this were the case, the effects of UI would be to dramatically increase the aggregate unemployment rate. This would explain why welfare state institutions were consistent with low unemployment in the 60s, whereas they became associated with high unemployment in the 90s. In fact, LS show that a

[3] In MZ, the result is reinforced by the assumption that workers do not hold shares of firms, and that these are instead owned by a class of rentiers. Due to firing restrictions, firms offering 'bad jobs' are hurt by the increase in the reservation value of the 'poor' workers, and suffer a loss which does not affect any of the workers' utility. It is still true, however, that rich employed workers and firms prefer the laissez-faire environment, while poor employed and unemployed workers prefer to be in a welfare state economy.

calibrated version of their model can account for the whole increase in European unemployment.[4]

But why would the economic environment have changed and, in particular, why would the probability of a worker losing skills upon displacement have increased? The argument here is that recent technological change (e.g. IT revolution) tends to make skills (associated with destroyed jobs) obsolete at a faster rate. Evidence in support of this claim is the observation of an increase in the variability of individual earnings in the US, as documented by, among others, Gottschalk and Moffit (1994). This suggests that the destruction of old and the accumulation of new human capital tend to occur more rapidly (note, though, that the same evidence is consistent with the argument of an increasing importance of mismatch, emphasized by MZ). In summary, the argument proposed by LS stresses that in order to achieve the same degree of equality through UI, the society must now pay a much larger cost in terms of unemployment and output per capita.

Another mechanism which may reduce the distortionary impact of UI is discussed by Acemoglu (1997), where job creation is endogenous and firms can decide to produce either good (high productivity) or bad (low productivity) jobs. The sunk cost of creating a good job is larger than that of creating a bad job. Due to *ex post* rent sharing, the equilibrium tends to have too low a proportion of good jobs. Thus, increasing unemployment benefits have a beneficial effect on the equilibrium composition of jobs, since the impact of the benefits, via the outside option effect, is more important for low wage than for high wage jobs. In fact, Acemoglu shows that benefits can increase the absolute number of good jobs created, and not only their proportion of the total number of jobs in the economy and, in some cases, be welfare improving (see also Acemoglu and Shimer, 1999, 2000).

12.2.1. Some Empirical Evidence

A large body of empirical literature has studied various aspects of displaced workers' behaviour. The data lend strong support to salient features of standard search theory. In particular,

1. workers accumulate human capital through learning by doing, and large components of accumulated human capital are sector-specific, region-specific, and profession-specific
2. the geographical and sectoral mobility in Europe is substantially smaller than in the US. In particular, the search behaviour of agents with more 'specific' or 'specialized' human capital is very sensitive to the level of UI: higher UI benefits make specialized workers substantially more picky.

Standard search theory has the implication that workers suffering large wage losses upon accepting certain job offers should reject these offers if UI were more generous. Given that benefits are more generous in Europe than in the US,

[4] See Haefke (1999) for a criticism of the LS argument in a model with endogenous job destruction.

post-displacement wage losses should therefore be lower in Europe than in the US, which is confirmed by the data. A range of empirical studies suggests that displacement leads to 10–25 per cent wage losses in the US (see e.g. Jacobson *et al*., 1993; Hamermesh, 1989; and Fallick, 1996 for reviews of the literature). In contrast, post-displacement wage losses upon re-employment seem to be relatively small in Europe. Leonhard and Audenrode (1995) document that displaced workers experience no wage loss in Belgium, and Burda and Mertens (1998) find very low post-displacement wage losses in Germany (i.e., full-time employed men displaced in 1996 and re-employed in 1997 suffered an average wage reduction of 3.6 per cent in comparison with those with no unemployment spell in that period). Using US data from the Continuous Wage and Benefit History, Meyer (1990) finds support for another important aspect of search theory; namely that higher benefits have a strong negative effect on the probability of exiting unemployment.

Let us now turn to evidence on sector-specific learning by doing. The effect of switching industries on the wage earning of displaced workers is well documented. For the US, Neal (1995) finds that workers switching industries after losing their previous job, usually suffer much larger losses than observationally equivalent workers remaining in the same industry. On an average, the wage loss for a male worker changing industries is in the order of 15 per cent, while if staying, he would only suffer a loss in the order of 3 per cent. Moreover, wage losses increase with experience and tenure, and at a much more pronounced rate for those changing industries than for those remaining. Using the displaced workers survey (DWS), Topel (1990) shows that the wage fall associated with job displacement increases with 1.3 per cent for each extra year of tenure in the job from which the worker was displaced. General labour-market experience is substantially less important for the size of the wage loss. This evidence suggests that there is a significant on-the-job accumulation of human capital and that part of this human capital is lost if a worker switches industries.

As concerns the issue of whether UI affects the degree of sectoral mobility of workers, Fallick (1991), using the DWS, documents that higher UI 'retard the mobility of displaced workers between industries' (p. 234), i.e., reduces the rate at which displaced workers become employed in other sectors than the one in which they where laid off. In contrast, UI has little effect on re-employment rates in the same industry.

Moreover, on the relationship between the accumulation of 'specific' human capital and search behaviour, Thomas (1996) finds, using Canadian micro-data, that workers' average unemployment spells increase with tenure for UI recipients (increasing tenure to 5 years increases the unemployment spell by 18 per cent). Using the DWS, Addison and Portugal (1987) report similar findings. Since tenure is correlated with specialization in our model, these findings are in line with our idea that more specialized (high tenure) displaced workers tend to be more selective in the search process, since they have more to lose from switching to jobs for which they are not qualified.

In summary, we feel that both the theoretical and the empirical literatures suggest that UI has strong effects on the labour-market outcomes. In particular, UI increases the unemployment rate and induces workers to acquire human capital associated with more 'risky' labour-market careers, which, in turn, make them less mobile.

12.3. POSITIVE THEORIES OF UI

The previous section argued that differences in the unemployment insurance institutions might be a major factor in explaining the large differences in unemployment rates and earnings inequality observed in Western Europe and the US during the last 25 years. A serious shortcoming of the literature discussed is that it treats UI as an exogenous institution, which begs the question 'why do countries choose, through their political process, so dramatically different levels of UI?'

A first possible answer could be that agents have different preferences in different countries, or that agents have different perceptions of the effects of different institutions on the economic performance (e.g., Piketty, 1995). An alternative approach is to provide a positive theory addressing why such different UI levels are observed across countries. To this end, a small but growing literature has instead taken labour-market behaviour as given and analysed precisely the social preferences over UI (Wright, 1986; Saint Paul, 1993, 1996, 1997; Di Tella and MacCulloch, 1995; Hassler and Rodríguez Mora, 1999; Pallage and Zimmermann, 1999*a*,*b*).

A seminal contribution to this literature is due to Wright (1986), who explores the choice of UI in a median voter model where agents switch stochastically between being employed and unemployed. Since the median voter is employed, and the employment status is persistent, the employed face a trade-off between insurance against future unemployment spells on the one hand, and an expected transfer to the unemployed on the other.

Saint Paul (1993, 1996, 1997, and 1999) studies various politico-economic implications of unemployment, the labour-market, and labour-market regulation. Saint Paul (1993) investigates how reducing firing costs by means of a two-tier system may be politically feasible. Saint Paul (1996) argues that labour-market rigidities in European countries, including the underlying institutional regulations, can be understood as the outcome of political influence by incumbent employees, since policies increasing unemployment in many cases benefit these insiders and provide some empirical evidence. Saint Paul (1997) studies how labour-market status affects the preferences for the provision of a public good and subsidies, and explores the implied dynamics of government expenditures. Finally, Saint Paul (1999) inquires into the political support for employment protection legislation in a model where workers face a trade-off between employment protection and the adoption of new technology, which requires creative destruction.

Pallage and Zimmermann (1999*a*,*b*) explore models with asymmetric information about the search effort of the unemployed. In particular, the unemployed are supposed to accept any relevant job offer, but since the insurance agency cannot observe the job offers, there is moral hazard in that the unemployed can turn down job offers without being detected. The workers are heterogenous in skills and employment status, and vote over the unemployment benefits. The decisive voter—whose wage is typically below average—faces a trade-off between redistribution on the one hand and efficiency (more job offers accepted) on the other.

Hassler and Rodríguez Mora (1999) extend the work by Wright (1986) by introducing a capital market where agents can self-ensure against the risk of experiencing unemployment by accumulating buffer stocks of savings. This precautionary saving can serve as a substitute for public UI and thus affect individual preferences and the level of UI chosen by the political system. However, the degree of substitutability between public UI and precautionary savings depends on the expected rate of turnover between employment and unemployment. If the duration of job and unemployment spells is low (high), i.e., turnover high (low), precautionary savings is a good (bad) substitute for UI. Thus, if UI is costly, for example because of distortionary taxation, individuals living in a world with high turnover would choose low benefits and instead use precautionary savings to insure against the relatively frequent, but short, spells of unemployment. On the other hand, if turnover is low (but not too low), the demand for UI will be high, even if it is costly. Since turnover is typically much lower in Europe than in the US, this mechanism can offer an explanation why most European countries have chosen much more generous UI schemes than the US. Interestingly, their model shows that a worker who could choose between low and high turnover rates (with higher wages with low turnover) would be more prone to choose low turnover *conditional on having a generous UI*. Thus, not only the institutional framework is determined by the characteristics of the agents, but these characteristics depend on the level of UI in a symmetrical manner. The political process and private behaviour complement each other and suggest the possibility of multiplicity.

Summing up, the theoretical literature on the determination of UI suggest that the demand for UI will differ with the characteristics of the agents; employed workers will demand less than unemployed worker, for they do not expect to become unemployed. Moreover, workers facing high unemployment risk will demand more UI than workers facing low unemployment risk, because they can self-insure quite well against transitory unemployment risk (Krusell and Smith, 1998), which is less costly for the workers than publicly provided UI.

12.4. A UNIFIED THEORY OF SOCIAL INSTITUTIONS AND THE LABOUR MARKET

Sections 12.2 and 12.3 reviewed two strands of the literature, the former taking the UI system as given and analysing the impact on the labour market, and the latter taking the labour-market structure as given and exploring the resulting

social preferences and political choices. The purpose of this section is to provide a unified theory of social institutions and the labour market. In particular, we provide a theory that can account for why two societies populated by rational agents may choose very different levels of UI, even if the economies are identical in terms of production technology and agents' preferences.

The reason why different political choices emerge in our work is that, in different countries, the identity of the agents who are politically preponderant varies. This diversity, in turn, originates endogenously from the institutions on which agents vote. Therefore, different outcomes can be sustained as stable steady-state equilibria. It is this complementarity between individual *behaviour* on the labour market and the *policies* collectively chosen which is the driving force in our theory. Explanations of persistently different structures of societies in terms of multiple steady-states are present in a number of recent papers (Bénabou, 1998; Banerjee and Newman, 1993; Quadrini, 2000; Hassler *et al*., 2000). A common feature in these papers is that multiplicity does not originate from missing markets or strategic complementarity (a la Cooper and John, 1988), but from the interplay between the agents' private decisions (determining their characteristics) and their collective choices, determining public policies and institutions.

In one recent paper in this stream of literature, Hassler *et al*., 1999, multiplicity instead arises in the context of unemployment and labour-market institutions. In this model, workers are risk averse, and acquire sector-specific skills while employed. Depending on their current labour-market conditions, some agents attach more value to UI than others, causing divergent political views about the degree of income taxation for financing UI. The unemployed naturally prefer a more generous insurance than the employed. However, their political influence is limited, since the employed are more numerous (as in Wright, 1986). Therefore, the focus of the paper is on the heterogeneity of preferences across groups of employed workers. In particular, more *specialized* workers, i.e., those with a pronounced comparative advantage for working in a particular activity, will tend to value insurance more highly than workers with skills of a more general nature. When displaced a specialized worker faces a trade-off between accepting *any* job—and suffering a wage cut with respect to pre-displacement wage—or waiting for a job offer where there is a comparative advantage—implying a longer unemployment spell. Specialized workers, therefore, tend to pursue picky search strategies which, endogenously, entail more risk. In order to hedge this risk, they prefer a more generous UI. The selective search, in turn, reinforces the degree of specialization among workers. If one has held the same job in a particular industry for a long time, one is likely to have developed a more pronounced comparative advantage than a worker having frequently changed jobs and industries. For example, a mature miner who has only been working in mining activities is bound to suffer large wage losses if switching to a different sector, as ones human capital is very industry-specific.

It is precisely this reinforcing interaction between specialization and preference for insurance which can give rise to multiple steady-state equilibria.

In particular, two economies with small or even no differences in preferences or technology may end up with very different political choices over social insurance and therefore, large differences in their economic performance. Consider an economy where highly specialized workers are politically preponderant. On the one hand, this economy features a strong political pressure for high insurance. On the other hand, given a generous UI, unemployed workers tend to be picky, in order to retain their skills in the sector where they have an initial comparative advantage. This will, in turn, increase the proportion of highly specialized workers and sustain the demand for high insurance. Hence, this economy may have a stable equilibrium outcome with low employment turnover, low mobility between industries (or occupations), small post-displacement wage losses (since job-searchers are 'picky'), and high unemployment. Conversely, consider an economy where most workers have little specialization. The majority of workers then attach a low value to UI, so that low benefits will be chosen in equilibrium. Less insurance reduces the incentive for unemployed workers to be picky which, in turn, suppresses the proportion of narrowly specialized workers, and undermines the support for a generous UI system. Thus, this economy may have another stable equilibrium outcome with a high employment turnover, large post-displacement wage losses (since job-searchers are 'non-picky'), and low unemployment, where the majority is content with low benefits.

The main result in Hassler *et al.* (1999) is that a 'European' steady-state with high unemployment, low employment turnover and high UI can coexist with an 'American' steady-state with low unemployment, high employment turnover and low UI. Moreover, we show that a reasonably calibrated version of the model has two sustainable steady-state equilibria. One steady-state has an unemployment rate of 12.7 per cent, an average duration of unemployment of 23 months and a replacement ratio of 76 per cent, while the other steady-state features an unemployment rate of 6.4 per cent, an average duration of unemployment of 4.5 months and a 24 per cent replacement ratio.

These results illustrate our general point that social insurance affects economic behaviour, which, in turn, feeds back on preferences over social insurance. It is important to note, however, that the notion of *specialization* goes beyond 'human capital accumulation'. We believe that the notion of 'specialization' should have a broader interpretation, capturing the idea that Europeans are less mobile and more specialized than Americans in more ways than one. Two alternative interpretations that we find particularly fruitful are *geographical* specialization and *educational* specialization.

In terms of geographical specialization, we mean local networks, local knowledge, family ties and the distribution of house ownership. In terms of geography, the degree of heterogeneity in Europe is substantially larger than in the US. This statement embodies cultural heterogeneity—differences in language, work attitudes, corruption, business and work etiquette—as well as heterogeneity in tangible factors—differences in government regulations, welfare laws (e.g., that welfare claims are, in most cases, non-transferable across borders), etc.

Moreover, casual evidence suggests that the degree of discrimination against job applicants from other countries (and even regions within the same country) is larger in Europe than in the US. For instance, studies on Sweden (SOU, 1998) suggest the existence of grave discrimination against immigrants on the Swedish labour-market, including high skilled immigrants such as medical doctors or academics. Moreover, SOU (1998) argues, that unemployed who move to a different region within Sweden in order to find a job do *not* find new jobs more quickly than their counterparts choosing not to move. This evidence suggests that local knowledge, local networks, and discrimination against applicants from other regions should play a more important role in the job search process in Europe, while its importance is probably smaller in the US.

Finally, our last interpretation of geographical specialization is the distribution of house ownership. Because of high transaction costs, house ownership implies a larger fixed cost of moving than for non-house owners, which should reduce geographical mobility.[5] Moreover, house owners should, given the larger risk they bear, be relatively more prone to support more generous UI. Thus, a country with a high fraction of owner-occupied housing, should be expected to have a high unemployment rate. Indeed, Oswald (1997) shows that the fraction of owner-occupied housing is highly correlated with the unemployment rate across a sample of OECD countries.

When turning to *education* as specialization, what we have in mind is education as a risky human capital investment. Prospective students might choose to invest in specialized human capital assets yielding a high wage in one particular occupation, but low wages in others. Alternatively, they could pursue a more generalized education providing skills applicable to many occupations, and therefore paying an intermediate wage in many occupations. We believe the former (specialized) education to be more prevalent in Europe, manifested, for instance, in the German apprenticeship system. A general undergraduate degree—by far the most popular college education on either continent—represents what we mean by a more 'generalized' education.[6]

12.5. A SIMPLE MODEL WITH POLICY-BEHAVIOUR COMPLEMENTARITY

In this section, we illustrate the main points of Section 12.4 with the aid of a simple, highly stylized model featuring joint determination of policy and

[5] Moreover, if an unemployed house owner in an economically depressed area contemplates moving to a more economically vibrant area, the value of her house will be low, relative to the cost of housing in the alternative residence. In this sense, house ownership magnifies the unemployment risk because moving away from a weak labour market becomes more costly. However, if UI is generous and has long duration, the risk associated with house ownership becomes less threatening, and more workers should own their home. Thus, a generous UI should, over time, induce agents to accumulate assets—residential capital—embodying risk that is highly correlated with unemployment risk.

[6] There is direct evidence that college education serves as an insurance against unemployment risk. For instance, Hubbard *et al.* (1995) argue that less educated agents face a substantially riskier income stream than do college graduates. In particular, they find that the variance of shocks to individual

behaviour in the context of labour-markets. The set up is that of an educational choice (related to our discussion in Section 12.4) where agents choose between a specialized education—featuring a high return while being subject to substantial unemployment risk—or a more generalized education, embedding an insurance against unemployment, since skills are more generally applicable.

The model is a standard overlapping-generations model with no capital markets and no private insurance. Individuals live for three periods and are identical at birth. In the first period of life, each individual chooses $s^i \in \{f, r\}$ in order to maximize expected life-time utility, given by

$$\ln c_{2,t+1} + \beta \ln c_{3,t+2} \tag{12.1}$$

for an individual born in period t.

Individuals work and receive a stochastic wage w^i in the second and third periods of their lives

$$w^i = \begin{cases} 1, & \text{if } s^i = f \\ \omega \geq \dfrac{1}{p}, \text{with probability } p & \text{if } s^i = r \\ \gamma, \text{ with probability } (1-p) & \text{if } s^i = r. \end{cases} \tag{12.2}$$

We think of this as representing an economy with a trade-off between flexibility and productivity. The interpretation of s^i is that it represents an investment decision that individuals make when young, which cannot be reversed later without a cost. Here, we simplify by assuming this cost to be high enough to always deter reversal.

If an individual chooses f, we say that she becomes of type *flexible*, which means that she can readily adapt to shocks that are non-symmetric with respect to different sectors or jobs. If the choice is $s^i = f$, the wage is unity and if a negative productivity shock hits her sector (job), she can easily find a new job with equal pay. If, on the other hand, $s^i = r$, it is costly or impossible to find a new job. Thus, she experiences an income loss of $\omega - \gamma$. Individuals who have chosen $s^i = r$ are thus said to be of type *rigid*. We index unemployment by $(1-p)$ times the number of rigid individuals. The key features of s^i are that it is a state variable affecting the probability distribution of shocks later in life, and thus preferences over different insurance schemes.[7]

At the beginning of each period, before individual wages are revealed, a political decision mechanism uses simple majority voting to decide on the level of UI, with a replacement ratio denoted $b \in [0,1]$. The insurance applies to all active workers, who are the only participants in the political process. Each generation is of identical size. The insurance is financed via a proportional tax on labour income, denoted τ.

income, conditional on previous earnings, is twice as large for agents with high school only, compared to agents with a college degree.

[7] Alternatively to an educational choice, one could think of s^i as representing other choices entailing a trade-off between specialization and flexibility, such as whether to buy a house or rent an apartment.

The insurance system is assumed to work under a balanced budget requirement. This means that if all working individuals are rigid, the tax rate is given by

$$\tau = \frac{b(1-p)}{p - b(1-p)}. \tag{12.3}$$

So, given b and τ, the three possible values for net income are $1-\tau$, $(1-\tau)\omega$ and $b(1-\tau)\omega$.

12.5.1. Steady-state Equilibria

Let us now restrict the analyses to steady-state equilibria. For simplicity, we make the following tie-breaking assumption; if all old individuals (representing 50 per cent of the electorate) vote for some benefit level, that level is implemented. We will show that both a full insurance, high unemployment and a no insurance, zero unemployment equilibrium may co-exist.

Consider first the old generation, who have already chosen s. These individuals will not be forward-looking when choosing voting behaviour, since they will soon disappear from the scene. If they are flexible, they have nothing to gain from the insurance, so voting $b=0$ weakly dominates all other voting strategies. On the other hand, if they are all rigid, they have a risk-reduction motive for insurance, and the insurance is at least actuarially fair (the expected pay-off is zero if all working individuals are rigid and positive otherwise). Thus, voting $b=1$ is weakly dominating.

Now, consider the middle-aged individuals. Clearly, if they all are flexible (rigid), they cannot manipulate the voting outcome the following period, since that outcome is then perfectly determined by the type of the middle-aged. As for the old, the strategy to vote for zero insurance if flexible and full insurance if rigid, then weakly dominates all other strategies.

Finally, let us consider the young. Clearly, the optimal choice of s depends on the expectations of the young regarding future benefits. However, in period t, the young can perfectly infer the value of b_{t+1}, if all current middle-aged are of the same type. Benefits in period $t+2$, on the other hand, are not predetermined in period t, since they depend on choices made in t and $t+1$.

Consider first a potential steady-state equilibrium, denoted SSE_0, where all individuals are flexible and benefits are zero. This is a steady-state equilibrium if no young individual wants to deviate by choosing to become rigid. Consider a deviation in period t and note first that $b_{t+1}=0$ but b_{t_2} is possibly positive. Let us first analyse the payoffs for the two alternatives, deviating and not deviating for any out-of-steady-state belief about b_{t+2}. Denoting the payoff to the deviator and the non-deviator U_0 and U_0^d, we see that

$$\begin{aligned} U_0^d &\leq p \ \ln \ \omega + (1-p)\ln\gamma + \beta \ln(1-\tau_{t+2})\omega \\ &= (p+\beta) \ \ln \ \omega + (1-p) \ \ln \ \gamma + \beta \ln(1-\tau_{t+2}) \end{aligned}$$

where the inequality is strict unless $b_{t+2}=1$. On the other hand,

$$\begin{aligned} U_0 &= \ln(1) + \beta\ \ln(1-\tau_{t+2}) \\ &= \beta\ \ln(1-\tau t+2). \end{aligned} \tag{12.4}$$

Thus, SSE_0 exists regardless of out-of-equilibrium beliefs if

$$(p+\beta)\ \ln\ \omega + (1-p)\ \ln\ \gamma < 0. \tag{12.5}$$

Consider now the potential steady-state equilibrium SSE_1, where all individuals are rigid and benefits are 1. Then, $b_{t+1}=1$, and

$$U_1^d \leq\ \ln(1-\tau_{t+1}) + \beta\ \ln\ 1 = \ln(1-\tau t+1), \tag{12.6}$$

and

$$\begin{aligned} U_1 &\geq \ln(1-\tau t+1)\omega + \beta(p\ \ln\ \omega + (1-p)\ \ln\ \gamma) \\ &= \ln(1-\tau t+1) + (p+\beta)\ \ln\ \omega + \beta(1-p)\ \ln\ \gamma. \end{aligned} \tag{12.7}$$

Thus, deviating by choosing to be flexible is dominated if

$$(p+\beta)\ \ln\ \omega + \beta(1-p)\ \ln\ \gamma > 0. \tag{12.8}$$

As we see, (12.5) and (12.8) can both be satisfied, provided $\beta<1$. If they are, both the full insurance-rigid and the no-insurance-flexible steady-state equilibria exist simultaneously, regardless of out-of-equilibrium beliefs.

If we restrict out-of-equilibrium beliefs, the set of parameters generating multiple steady states may increase. For example, suppose young individuals observing a middle-aged individual who deviated in the previous period, believe that benefits will not change. Then, the full insurance-rigid equilibrium always exists, since the deviator and the non-deviator are taxed at the same rate while gross income is higher for the non-deviator (ω versus 1). The condition for the existence of the no-insurance-flexible steady-state equilibrium is that

$$(p+\beta)\,(p\ \ln\ \omega + (1-p)\ \ln\ \gamma) < 0. \tag{12.9}$$

12.5.2. Policy Persistence

Let us conclude this section by analysing the dynamic stability of our two equilibria. In other words, we want to see if the equilibria show policy persistence in the sense that if an economy is in one equilibrium, it tends to remain there.

Consider first SSE_0. If all young individuals choose to become rigid, they will certainly be able to implement full insurance but not until they become old. Clearly, if (12.5) is satisfied, there is an incentive to deviate from this concerted action to break out of SSE_0, which is persistent. Similarly, if the economy is in SS_1, if all young individuals choose to become flexible, the benefits will go to zero after two periods. However, if (12.8) is satisfied, the individual incentives will be against this and, hence, SSE_1 is also persistent. Note also that discounting is

important for stability since policy changes takes time and do thus incur a cost in the short run but a gain in the long run.

In conclusion, this simple model exhibits some form of policy-behaviour complementarity; individuals tend to choose to be flexible (rigid) if current benefits are low (high), and if individuals have previously chosen to be flexible (rigid), they want low (high) benefits. The policy choice depends on aggregate state variables and is thus predetermined in every period. This is a stylized representation of the mechanism discussed at more length in Section 12.4. The model entails a number of simplifications which can be relaxed such as, for instance the fact that the choice of specialization is irreversible. As shown in our previous work (Hassler *et al.*, 1999), most of these simplifications are inessential for the main argument to go through.

12.6. CONCLUSIONS

In this chapter, we have surveyed some recent literature discussing (i) the effect of unemployment insurance on labour-market performance; and (ii) the determination of preferences for social insurance, given an exogenous labour-market behaviour. We have argued that a unifying general equilibrium approach—where both policy and agents' behaviour are jointly endogenously determined—is fruitful. In particular, this approach can help explain the large differences across labour-market performance and institutions in the US and Europe, without resorting to exogenous structural differences in these economies, other than different initial distributions of agents. The general mechanism driving the results has been labelled policy-behaviour complementarity. In the context of our particular application, we thus mean that individuals tend to choose to be flexible (rigid) if current benefits are low (high), and if individuals have previously chosen to be flexible (rigid), they want low (high) benefits.

An insight from our analysis is that social insurance institutions are naturally persistent. For instance, generous UI today enhances the conditions for generous UI tomorrow. Thus, a policy reform involving reduced UI in Europe should be met by strong initial opposition. But, as the new levels of UI over time change the distribution of the labour force, this opposition will fade and the political support for the reform will increase. We have argued, however, that a UI reform involving reduced benefits in Europe is not necessarily welfare improving, even if this reform were to decrease unemployment substantially.

APPENDIX

UI and the Labour-Market: Implications of a Simple Search Model

The purpose of Appendix is to illustrate, with the use of a simple search model, two fundamental effects of UI on the labour-market; that unemployment benefits increase unemployment and reduce wage inequality.

Consider an economy populated by *ex ante* identical risk neutral workers. In each period, each worker can be either employed or unemployed. If unemployed, she receives the unemployment benefit b, and suffers a search cost $\sigma(c)$, where $\sigma(0)=0$, $\sigma'>0$ and $\sigma''>0$, and c is the time devoted to search. Moreover, at the Poisson arrival rate $p(c)=\lambda c^{\varepsilon}$ (where $\varepsilon<1$), she receives a wage offer $\omega(x)=w-ax$ drawn from a uniform distribution, where $x\in[0,1]$ and $w>a$. If the offer is accepted, she moves into employment and receives the wage $\omega(x)$, until a separation occurs. Separations arrive at the exogenous rate s. The value function for an employed worker who has accepted an offer paying the wage $\omega(x)$ is given by

$$rW(x)=\max\{w-ax+s(U-W(x)),rU\}$$

whereas the value of being unemployed is

$$rU=b-\sigma(c)+p(c)\int_0^1(W(x)-U)\,\mathrm{d}x.$$

Workers face interesting decision problems only when unemployed. In particular, each of them will have to decide (i) the optimal search effort level, c^*, and (ii) the cut-off level, $\bar{x}$, such that wage offers paying more or equal to (less than) $\omega(\bar{x})$ are accepted (rejected). The cut-off is found by equating $W(\bar{x})=U$. This yields, after some algebra

$$w-a\bar{x}-b+\sigma(c)=\frac{\bar{x}p(c)}{r+s+p(c)\bar{x}}\left(w-\frac{a\bar{x}}{2}-b+\sigma(c)\right) \tag{12.A1}$$

or, equivalently

$$w-b+\sigma(c)=a\bar{x}\frac{r+s+\lambda c^{\varepsilon}\bar{x}/2}{r+s} \tag{12.A2}$$

which shows that, conditional on c, an increase in benefits, b, reduces $\bar{x}$ (the unemployed become more picky).

We then need to determine the optimal search effort, c^*. This is found by setting c so as to maximize welfare of the unemployed. The solution yields

$$\begin{aligned}\sigma'(c)&=p'(c)\int_0^{\bar{x}}(W(x)-U)\mathrm{d}x\\&=p'(c)\,\bar{x}\frac{w-a\bar{x}/2-b+\sigma(c)}{r+s+p(c)\cdot\bar{x}}.\end{aligned} \tag{12.A3}$$

From 12.A1–12.A3, recalling that $p(c)=\lambda c^{\varepsilon}$, we obtain

$$\sigma'(c)\cdot c/\varepsilon-\sigma(c)=w-a\bar{x}-b. \tag{12.A4}$$

Using 12.A2–12.A4, we obtain

$$\sigma'(c) \cdot c^{1-\varepsilon} = \frac{a\bar{x}^2}{2}\frac{\varepsilon\lambda}{r+s}. \tag{12.A5}$$

Equations 12.A4 and 12.A5 define equilibrium. Note that an increase in b will induce the unemployed workers to become pickier (lower $\bar{x}$) and exert a lower search effort.

This simple model has implications on unemployment and wage inequality. Assume the total mass of workers to be one. In this economy, unemployment is determined by the following differential equation:

$$\dot{u}_t = s \cdot (1 - u_t) - \lambda c^{\varepsilon}\bar{x} \cdot u_t$$

which yields the steady-state

$$u_t^S = \frac{s}{s + \lambda c^{\varepsilon}\bar{x}}.$$

Thus, high benefits increase unemployment by reducing the outflow from unemployment, and increasing the average duration of unemployment. Simple extensions can be constructed, emphasizing the effects of b on long-term unemployment. We will only sketch the argument here. Assume that, with the positive arrival rate ξ, an unemployed worker loses her skills and becomes unemployable. If we maintain the assumption that benefits are unlimited over time, then we have that $U^{LR} = b/r$.[8] The value function of the unemployed becomes, in this case

$$(r + \xi)\, U = b\,(1 + \xi/r) - \sigma(c) + p(c) \int_0^1 (W(x) - U)\, \mathrm{d}x$$

It should be intuitive that, in this case, high benefits increase both unemployment and the share of long-term unemployment.

UI also affects the equilibrium wage inequality. By shrinking the range of job offers regarded as acceptable, benefits decrease the inequality between fortunate and unfortunate workers (recall that $a\bar{x}$ is a measure of the spread of the age distribution). The comparative statics of this simple model therefore illustrates two effects of UI on the labour market outcome: unemployment benefits increase unemployment and reduce wage inequality.

Skill-biased Technological Change

The purpose of this section is to illustrate how our simple search model can be consistent with the observations that both Europe and US featured low

[8] In order to avoid that all workers eventually become long-run unemployed, we need to abandon the assumption that workers are infinitely lived, and assume that each worker faces a positive probability of death, and that each newborn enters the labour force as unemployed (as in Blanchard, 1985).

unemployment and low wage inequality in the 60s and 70s, while the US have experienced rising wage inequality but little change in unemployment during the 80s and 90s. In contrast, European countries have experienced rising unemployment but little change in wage inequality. The key change relative to the simple search model in Appendix is to add skill-biased technological change to the framework.

Consider, first, a version of the simple model constructed above where search effort is inelastically supplied (thus, set $\sigma(c) = 0$ and $p(c) = p$). Let two economies be different in the UI regime only. For simplicity, assume that in an 'American' laissez-faire economy $b = 0$, whereas in a 'European' welfare state economy $b = b^{WS} > 0$. Furthermore, assume that parameters are such that $w - b^{WS} > a\frac{r+s+p/2}{r+s}$, implying that, in both economies, $W(1) > U$. This means that, in both economies, agents will always accept any job offer, and the two economies have the same unemployment rate ($u^S = s/(s+p)$) and wage inequality.[9] Next, assume that both economies are hit by a common shock changing the wage offer distribution. In particular, after the shock, agents in both economies face the wage offer distribution $\omega(x) \in [\gamma w - \tilde{a}x]$, where $\tilde{a} \equiv (a + 2(\gamma - 1)w)$. Note that, under this assumption, the expected wage does not change (in particular, $\bar{\omega} = w - a/2$), but its variance increases. MZ refer to a shock of this type as 'mismatch-biased' and argue that this is related to what other papers have referred to as 'skill-biased' technical change. This shock enhances the relative value for a worker finding the right match, or, equivalently, increases the cost for an agent of accepting an unsuitable job. Assume, further, that

$$b^{WS} > \gamma w - \tilde{a}\frac{r+s+p/2}{r+s} > 0.$$

In this case, it is easy to see that in the laissez-faire equilibrium, all jobs will continue to be accepted, whereas in the welfare state economy, unemployed workers will decline all job offers paying a wage $\omega(x)$ such that $x > \bar{x} \equiv \left[\sqrt{(r+s)^2 + 2p(\gamma w - b)} - (r+s)\right]/2$. Thus, on the one hand, the unemployment rate will remain unchanged in the laissez-faire economy, whereas it will increase in the welfare state economy. More precisely, unemployment will increase in this economy from $u^{S0} = s/(s+p)$ to $u^{S1} = s/(s + p\bar{x})$. The inequalizing nature of the shock will, on the other hand, unambiguously increase wage inequality in the laissez-faire economy, whereas this will be partially offset in the welfare state economy by the changes in the search behaviour of the unemployed.

[9] In a more elaborated model where job creation is endogenous and wages are determined by Nash bargaining, b would also affect unemployment through its effect on the equilibrium wage rate (outside option effect). See MZ.

REFERENCES

Acemoglu, D. (1997). Good jobs versus bad jobs, *CEPR discussion paper* 1588.

Addison, J. and P. Portugal, (1987). On the distributional shape of unemployment duration, *Review of Economics and Statistics*, 69, 520–26.

Banerjee, A. and A. Newman, (1993). Occupational choice and the process of development, *Journal of Political Economy*, 101 (2), 274–98.

Bénabou, R. (1998). *Unequal Societies: Income Distribution and the Social Contract* Mimeo; New York University.

Blanchard, O. (1985). Debt, deficits, and finite horizons, *Journal of Political Economy* 93, 223–47.

Burda, M. and A. Mertens, (1998). Wages and workers displacement in germany, *CEPR discussion paper* 1869.

Cooper, R. and A. John, (1988). Coordinating coordination failures in Keynesian models', *Quarterly Journal of Economics*, 103 (3), 441–63.

Di Tella, R. and R. MacCulloch (1995). The determination of unemployment benefits, *Oxford Applied Economics discussion paper series* 180.

Fallick, B. C. (1991). Unemployment insurance and the rate of re-employment of displaced workers, *Review of Economics and Statistics*, 73 (2), 228–35.

Fallick, B. C. (1996). A review of the recent empirical literature on displaced workers, *Industrial and Labor Relations Review*, 50 (1), 5–16.

Freeman, R. B. (1996). Towards an apartheid economy? *Harvad Business Review*, 115–121.

Gottschalk, P. (1997). Inequality, income growth, and mobility: The basic facts' *Journal of Economic Perspectives*, 11 (2), 21–40.

Gottschalk, P. and R. Moffit, (1994). The growth of earnings instability in the US labor market, *Brookings Papers on Economic Activity*, 217–72.

Haefke, C. (1999). The European unemployment puzzle: The importance of bargaining and endogenous job destruction in a dynamic matching model, Unpublished Manuscript.

Hamermesh, D. S. (1989). What do we know about worker displacement in the United States? *Industrial Relations*, 28 (1), 51–9.

Hassler, J. and J. V. Rodríguez Mora, (1999). Employment turnover and the public allocation of unemployment insurance, *Journal of Public Economics*, (forthcoming).

—— —— K. Storesletten, and F. Zilibotti, (1999). Equilibrium unemployment insurance, *CEPR working paper* 2126.

—— *et al.* (2000). Equilibrium redistribution and forward-looking dynamics, Mimeo Stockholm University.

Hubbard, R. G., J. Skinner, and S. P. Zeldes, (1995). Precautionary savings and social insurance, *Journal of Political Economy*, 103 (2), 360–99.

Jacobson, L. S., R. J. LaLonde, and D. G. Sullivan, (1993). Earnings losses of displaced workers, *American Economic Review*, 83 (4), 685–709.

Krusell, P. and A. A. Smith, (1998). Income and wealth heterogeneity in the macroeconomy, *Journal of Political Economy*, 106 (5), 867–98.

Leonhard, J. and M. V. Audenrode, (1995). The duration of unemployment and the persistence of wages, *CEPR discussion paper* 1227.

Levy, F. and R. J. Murnane, (1992). U.S. earnings levels and earnings inequality: A review of recent trends and proposed explanations, *Journal of Economic Literature*, 30 (3), 1333–81.

Ljungqvist, L. and T. Sargent, (1998). The European unemployment dilemma *Journal of Political Economy*, 106, 514–50.

Marimon, R. and F. Zilibotti, (1999). Unemployment vs. mismatch of talents reconsidering unemployment benefits, *Economic Journal*. (forthcoming).

Martin, J. P. (1996). Measures of replacement rates for the purpose of international comparisons: A note *OECD Economic Studies*, 26, 99–115.

Meyer, B. D. (1990). Unemployment insurance and unemployment spells *Econometrica* 58, 757–82.

Mortensen, D. and C. Pissarides, (1999), Unemployment responses to skill-biased shocks: The role of labor market policies, *Economic Journal*. (forthcoming).

Neal, D. (1995). Industry-specific human capital: Evidence from displaced workers, *Journal of Labor Economics*, 13 (4), 653–77.

Nickell, S. (1997), Unemployment and labor market rigidities: Europe versus North America, *Journal of Economic Perspectives*, 11 (3), 55–74.

Oswald, A. J. (1997). The missing piece of the unemployment puzzle, Mimeo, University of Warwick.

——— ——— (1999*a*), Heterogenous labor markets and the generosity towards the unemployed: An international perspective, *CREFE working paper* 88.

Pallage, S. and C. Zimmermann, (1999*b*). Voting on unemployment insurance, Mimeo, Université du Québec à Montréal.

Piketty, T. (1995). Social mobility and redistributive politics, *Quarterly Journal of Economics*, 110 (3), 551–84.

Quadrini, V. (2000). Growth, learning and redistributive policies, *Journal of Public Economics*. (forthcoming).

Saint Paul, G. (1993). On the political economy of labor market flexibility, *NBER Macroeconomic Annuals*.

——— (1996). Exploring the political economy of labor market institutions, *Economic Policy*, 23, 265–300.

——— (1997). Voting for jobs: Policy persistence and unemployment, *CEPR discussion paper* 1428.

——— (1999). The political economy of employment protection, *Universitat Pompeu Fabra working paper* 346.

Thomas, J. M. (1996). An empirical model of sectoral movements by unemployed workers, *Journal of Labor Economics*, 14, 126–53.

Topel, R. (1990). Specific capital and unemployment: Measuring the costs and consequences of job loss, *Carnegie Rochester Conference Series on Public Policy*, 33, 181–214.

Wright, R. (1986). The redistributive roles of unemployment insurance and the dynamics of voting, *Journal of Public Economics*, 31 (3), 377–99.