

THE IMPLICATION OF TAX RATES ON CORPORATE CAPITAL INVESTMENT

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The purpose of this study is to determine the relationship of tax rates and corporate capital investment behaviour. In addition, this study seeks to investigate the influence of tax rates reductions on capital investment. A total of 120 companies were selected as the sample. The findings demonstrated that there are significant negative associations between corporate tax rate and non-resident individual tax rate reduction with corporate capital investment. In addition, the results revealed the significant influence of market-to-book equity ratio and lagged investment on capital investment. With respect to industry classification, property and plantation industries are found to be significant and negatively associated with capital investment. This research would be useful to the authorities in determining the implication of tax rate reduction on capital investment, which in turn will reflect the overall economy.

Keywords: *Corporate tax rate, individual tax rate, capital investment, tax rates reductions*

Introduction

Naturally almost all businesses prefer to pay low taxes or gain some tax savings. Tax savings are achieved in many ways either legally or illegally. To some businesses, tax savings allow business expansion or additional capital investment. Thus, a number of governments respond to such idea by reducing the national tax rates. Malaysia is not in the exception where since its independence, the national tax rates have been changed several times. The changes were necessary to ensure continuous stimulation of the economy and hence strengthening the development of business sector. The development of businesses can be seen through the growth of their capital investment. However, there is little evidence in literature, particularly related to Malaysian businesses, that supports the contention that reductions of tax rates inspire the growth of capital investment. Therefore, this study attempts to investigate whether the

reduction of tax rates by Malaysian government affect the capital investment behaviour among companies.

Problem Statement and Motivations of The Study

The lack of empirical evidence, which explains the relationship between tax rates and capital investment, may lead to ambiguous decision-making made by the government. Unnecessary tax rates reductions may be decided by the government without taking into consideration the overall outcomes from such a decision. Thus, a theory is needed to explain such a relationship before making a decision to reduce tax rates. This is because of the implication of tax rates reductions in which it may contribute to the government shortfall of revenues and in turn, impairs the overall economy. However, if the increment of capital investment could compensate the shortfall, perhaps more than expected, the decision made by the government is in the right track. Therefore, the growth of capital investment has to be observed to determine whether businesses responded to the reduction of tax rates.

Industrial output is one of the factors of economic growth. Fixed capital investment and exports are two important determinants for industrial output growth (Yu, 1998). Hence, it appears that fixed capital investment is an item that could impact the economy of a country. According to Byers, Groth, Richards and Wiley (1997), there are seven main factors of economic variables that might affect the manager's capital investment decision. The factors consist of true incremental analysis, true economic costs, after tax cash flows, cost of capital, the economic life of the depreciable life for tax purposes and salvage value. In addition to that, Due (1961) highlighted that states taxes could influence manager's plant investment decision. Therefore, we assume that the reduction in tax rates could influence the capital investment trend in Malaysia.

The decrement in tax rates directly increases tax saving. Consequently, the increment of the tax savings would react indirectly to the capital investment behaviour in which if the tax rates decrease, the tax savings will increase and this is likely to surge the capital investment. The particular changes in capital investment behaviour might be due to attractive tax shield, which may reduce the cost of investment from the investors' or shareholders' point of view. However, this contention is still inconclusive. Further investigation, especially in a developing country like Malaysia, has to be carried out since its economic climate is different as compared to the other countries. Thus, this study will focus on the Malaysian companies' capital investment behaviour and its relationship with the tax rates (i.e. both company and individual tax rates).

Research Questions

The main research question of this study is to determine whether tax rates are related to the business development decision. Specifically, this study seeks the answers of the following questions:

1. Do tax rates relate with companies' capital investment behaviour?
2. Do tax rates reductions affect the companies' capital investment behaviour?

Objectives of the Research

The primary objective of this research is to investigate the relationship of tax rates and business development. Specifically, the study investigates:

1. The influence of the corporate tax rate on capital investment behaviour.
2. The influence of the average resident individual tax rate on capital investment behaviour.
3. The influence of the non-resident individual tax rate on capital investment behaviour.
4. The influence of the corporate tax rate reduction on capital investment behaviour.
5. The influence of the average resident individual tax rate reduction on capital investment behaviour.
6. The influence of the average non-resident individual tax rate reduction on capital investment behaviour.

Significance of the Research

The finding of this research would shed some light on the impact of the changes in tax rates (i.e. corporate and individual tax rates) on capital investment behaviour. It would enlighten the tax policy makers about the evidence that tax rates can be linked to the changes in capital investment. Besides, the findings would provide valuable information to shareholders and investors about the influence of the tax rate changes, which would afford attractive tax shield. In addition, the result may contribute to the body of the knowledge in increasing the understanding of the impact of the changes in tax saving on Corporate investment decision.

Literature Review and Hypothesis Development

Tax Rates and Capital Investment

Corporate tax rate could influence capital investment behaviour since high tax rates may cut the edge of the company. Black, Legoria and Sellers (2000) in their study on capital investment effects of dividend imputation highlighted that corporate tax rate could affect the capital investment in many ways such as decreases the net after-tax cash flows. Besides, Moody (1997) claimed that a flat tax would benefit businesses in several ways. Firstly, by way of encouraging new capital spending, secondly by eliminating tax biases against saving and investment, thirdly by eliminating anti-entrepreneurial taxes, fourthly by lowering tax compliance cost and finally, by reducing interest rates. Hence, it appears that corporate tax rate would allow immediate capital investment. Moody (1997) further defined the capital investment as inclusive of equipment, structures and land.

Additionally, corporate tax rate could influence capital investment by reducing the wealth of the owner (Mintz, 1981). This will discourage the owner to invest more in capital investment. In the case of petroleum industry, Cox and Wright (1976) found empirical results which indicated that there were three public policies that could impact petroleum reserves. The policies were special federal tax provision, state market-demand prorationing and federal oil import quota. In addition, they highlighted that these were highly related to the state and local governments' assessment on production and severance taxes on both quantity of production and revenue. In a research on a rate-of-return model of investment behaviour for Switzerland, Junge and Zarinnejad (1986) found statistically significant impact of taxes on investment. However, the exertion was quantitatively small. Overall, it appears that tax rate may influence capital investment behaviour in which excessive taxation and complicated tax rule may contribute to the drop in capital investment. Hence, it is hypothesized that:

H_1 : There is a negative association between capital investment behaviour and the corporate tax rate.

Similar to corporate tax rate, we would expect the same impact of the individual tax rate on capital investment behaviour. This is due to the influence of individual tax rate on capital investment as claimed by Black *et al.* (2000), which would affect the net cash flows. The individual tax saving might be channeled to investment in companies which in turn would increase the cash flow of the companies. Since the individual tax rate can be classified into two types based on residency status, the following hypotheses are developed:

H_2 : There is a negative association between capital investment behaviour and the average resident individual tax rate.

H_3 : There is a negative association between capital investment behaviour and the non-resident individual tax rate.

Tax Rates Reductions and Capital Investment

Moon and Hodges (1989) in describing the relationship to corporate tax system in investment behaviour found that the introduction of the alteration to the corporate tax system resulted in a sharp movement in capital investment, specifically, in manufacturing industry. They stated that the total capital investment in manufacturing industry for that year increased by 19.6 percent and the increment in all industries was 14.7 percent.

According to Hall and Jorgenson (1967), tax policy changes have a significant impact on corporate investment. The above-mentioned tax policy is inclusive of capital gain tax where the reduction of the tax rate would provide two important benefits, which are sufficient incentive for risk investment and direct capital to efficient investment by relying on market forces (Russell, 1999). This effect would also be applicable to the reduction in corporate tax rate where in such a scenario, higher corporate tax rate would reduce the net after-tax cash flows (Black *et al.*, 2000). Low after-tax cash flows would discourage the company to make capital investments since the higher tax rate will increase the cost of capital investments. This is in line with the finding by Cummins and Hasset (1992) which found that tax rate contributes to the cost of investment.

O'Neil (1944) in the article of the impact of high corporate tax on investment noted that high taxation of income will leave little reward to its owner even though the new capital acquisition has been economically successful. This will result in a low capital investment and this issue has always been argued. Further, he outlined that high corporate tax rate would not stimulate investment. In other words, the reduction of corporate tax rate will encourage capital investment among companies. This is in line with Krausz, Hochman and Schiff (1987), finding in which they showed that for certain asset classifications, lowering the tax rate from 406 to 33 percent reduced the net present value of an investment project. Thus, we would expect an opposite direction in which the reductions in corporate tax rate would increase the corporate capital investment. Hence, it is hypothesized that:

H_4 : The reduction in corporate tax rate will significantly increase the corporate capital investment.

In the case of individual tax rate, Russell (1999) asserted that high tax rate on labour and investment income will cause an inefficient tax system in which it would encourage individuals to minimize their investment especially in high risk investment. Besides that, a high tax rate will increase the cost of investment from the investors' point of view. This will lead to reduction in investment by individuals and thus will reduce the capital investment by companies. On the other hand, the reduction in individual tax rate would increase the tax saving and this would encourage personal investment by the individual taxpayers. Therefore, we hypothesize that:

H_5 : The reduction in the average resident individual tax rate will significantly increase the corporate capital investment.

H_6 : The reduction in non-resident individual tax rate will significantly increase the corporate capital investment.

Other Factors Affecting Capital Investment

In this study, several factors are incorporated in the model to control for the effect of non-tax factors on corporate capital investment behaviour and they are adopted from Black *et al.* (2000). The variables are: market to book equity ratio, debt to equity ratio, dividend payout ratio, capital intensity, firm size and lagged investment. In addition to that, industry classifications are also included in the model since the capital investment decisions are likely to be different for different industries.

Brigham (1995) highlighted that market to book equity ratio is the ratio of a share market price to its book value. He further described that the ratio could be an indicator of how investors regard the company in which a company with high rates of return on equity generally sell at higher multiples of book value than the other counterpart. Besides that, this ratio measures the firm investment opportunity where higher ratio indicates greater investment opportunities that are expected to yield returns in excess of the required rate of return (Black *et al.*, 2000).

Debt to equity ratio is one of the measurements for financial leverage. According to Warren, Reeve and Fess (2002), debt ratio measures the extent of credit used to finance

the asset. On the other hand, debt to equity ratio highlights the investment opportunity and its responses to the capital structure of the firm (Black *et al.*, 2000).

Dividend payout ratio may influence investors in several ways. High dividend payout ratio indicates that the company did not retain most of their earnings. It will attract the investors who aim for high return of investment. Opposed to that presumption, tax preference theory suggests that there is a likelihood for investors to prefer companies with low payout ratio since the effective tax rate for dividend might be more than capital gains tax rate (Brigham, 1995). Therefore, it is essential to control this factor in determining the capital investment behaviour.

Industry classification is another control variable, which may influence capital investment by several means such as capital utilization and investment incentives. Lim (1976) in his study on capital utilization of local and foreign establishments in Malaysian manufacturing found that there were certain industry-groups, which were having low utilization rates (for example, metal product, machinery and transport equipment). He further identified the industries with high capital utilization rate (for example, industrial chemicals and electrical machinery). In explaining the difference of investment behaviour, Smith and Watts (1992) highlighted that firm-specific investments result in variation in firms' investment opportunity sets. Therefore, it can be concluded that different firms in different industries might have different capital investment behaviour due to different opportunity sets.

Companies in different industries are likely to have different capital intensity. Morrison (1993) in explaining the causes and effects of high-tech capital investment and evaluating associated economic performance for the US chemicals and primary-metal industries affirmed that these industries were both capital intensive and exhibited very different firm behaviour. They further highlighted that the differences in capital intensity and investment responses would be important factors affecting observed economic performance.

The next variable is firm size, which may reflect the companies' ability to finance additional investment (Black *et al.*, 2000). Therefore, it is presumed that the larger firm would invest more in capital (property, plant and equipment) as compared to the smaller firm.

Prior investment also would affect the current investment decision. If the company decided to invest earlier, more financing will be needed due to scarce resources. This cyclical nature of investment is likely to result in negative relationship between lagged and current investments. However, it is also possible for the companies to invest their money progressively over a period of time. For these reasons, the relationship could go both ways.

Gross domestic product (GDP) is another control variable adopted in this study. Black *et al.* (2000) in their study used GDP as a control macroeconomic factor that might influence investment. The economic condition may influence capital investment in which the unfavourable economic condition for growth is not conducive for investment. This was demonstrated by Chenmao and Zhida (1999) in their study on property investment in China during the changing economic system. In the study, they employed square deviation

analysis for the increase rate of property investment, GDP and total fixed asset investment. From the result, they found significant difference between increase rate of property investment and GDP. They further asserted that GDP increase rate has a significant effect on property investment.

Apart from the GDP, another economic variable is the presence of economic crisis during the late 1990s. The Asian currency crisis is likely to affect the investment decision as well due to uncertainties in the economic conditions.

Research Design

Data Selection

The data of this research is in the form of panel data (i.e. pooled or longitudinal data). According to Fleischman (1995), such data will increase the explanatory power of the regression model. In addition, Carroll and Wasylenko (1994) suggested that this type of data will afford the greatest opportunity to “disentangle the systematic relationship between tax policy variables and the dependent variable”(page 20). Additionally, panel data analysis enables the researchers to analyze both the inter-temporal dynamics and the individuality of the entities being estimated.

The data was gathered from financial statement information, which was obtained from annual report of listed companies in Bursa Malaysia from 1988 to 1998. The sample includes only those companies which are incorporated on or before 1988 since the changes in tax rates occurred from 1988 to 1998. Companies, which are in finance, trusts and closed-end fund industries are excluded since those industries are governed by special rules and regulation.

The final sample of this research consists of 120 listed companies. It was derived after excluding companies which were not listed consequently for 11 years (1988 – 1998). Further, companies with incomplete data and dormant companies were also excluded. Table 1 discloses the process of sample selection.

Table 1: Sample Selection Process

Number of companies listed consequently from 1988 or before until 1998.		185
Less: Companies with incomplete data	48	
Dormant companies	15	
Companies which were categorized under finance industry for at least a year.	2	65
Final sample		120

Selected companies were attributable to eight industries that are consumer product, industrial product, trading and services, hotel, properties, plantation, mining and construction. Table 2 displays the percentage of observation of each industry during 1988 - 1998.

Table 2: Descriptive Statistics – Industry (n = 1320)

Industry	Cases	Percentage
Consumer product	128	9.7
Industrial product	597	45.2
Trading and services	126	9.5
Hotel	11	0.8
Properties	183	13.9
Plantation	187	14.2
Mining	51	3.9
Construction	37	2.8
Total	1320	100

Variable Selection and Measurement

Dependent Variable

a) Capital Investment (INV)

Capital investment is measured by scaling the gross property, plant and equipment (PPE) with total sales for each year. This is done in order to control for the inflation and growth as the total sales portrays such economic conditions. This is in line with Kern (1994) in the study of the redistribution of corporate plant and equipment as a result of the Economic Recovery Tax Act of 1981.

Independent Variables

This section is divide into two parts, which are hypothesis variables and control variables. To capture the objectives of this study, the tax variables are used to reveal the tax rates and tax rates reductions.

a) Hypothesis Variables

Tax Rates (CR, RIR & NIR)

The tax rates for each year for an 11-year period (i.e. 1988 to 1998) are presented in these variables in which they cover the corporate tax rate, average tax rate for resident individual and non-resident individual tax rate. Note that the resident individual tax rate is progressive in nature. Therefore, to take into account the tax rate for resident individual, we compute the average tax rate for each year of assessment.

Tax Rates Changes (CRC, RIRC & NIRC)

These variables consist of dummy variables of changes in corporate, resident individual and non-resident individual tax rates. The measurements are set-up as “1” if there are tax rates changes compared to previous year and “0” if otherwise.

b) Control Variables

In order to control other factors, which may affect the capital investment behaviour, the firm-specific variables are utilized in this study.

Market-to-Book Equity Ratio (MBR)

Market-to-book equity ratio is to mirror the difference between a company’s return on both existing and future assets and its required rate of return on equity (Collins and Kothari, 1989). This variable is measured by dividing market price of company’s share with its book value. The book value is the ratio of common equity to the number of shares outstanding.

Debt-to-Equity Ratio (DE)

Black *et al.* (2000) explains that this variable could be an instrument to control the effect of the financial leverage of the company. It is derived by dividing total debt with total equity.

Dividend Payout Ratio (DP)

This variable could reflect the capital investment behaviour in which high dividend payout ratio could encourage more investment. It is measured as cash dividend declared scaled by net earnings.

Capital Intensity (CINT)

In order to take into account the capital intensity impact of a company, this variable could be adopted to highlight the capital investment behaviour for various levels of capital intensity. In other words, those companies in high capital intensity industry might demonstrate different capital investment behaviour as compared to their lower capital intensity industry counterpart. This study measures this variable as the ratio of gross PPE to total assets.

Firm Size (SIZE)

Firm size is measured as a natural log of total assets. This factor is a control variable to reflect the affect of a company’s size on capital investment behaviour (Black *et al.*, 2000).

Lagged Investment (LINV)

This variable incorporates capital investment in a particular year with investment in the succeeding year. Consistent with Black *et al.* (2000), this variable is measured by dividing prior year’s capital investment with total sales.

Industry (DICP, DIP, DTS, DPROP & DPLN)

This variable is inserted to provide evidence on differential benefits across industries in Malaysia. This is important since each industry may utilize capital investment differently, for example, hotel industry might involve higher capital investment compared to consumer industry due to its capital intensity. In addition, there are industries which enjoy certain incentives of the capital investment incurred, for example, in United States, Kern (1994) highlighted that ERTA1, which was introduced in 1981, would encourage capital investment for some industries. In this research, five industry indicators are included in the model to capture the industry effects. They are consumer product, industrial product, trading and services, property and plantation.

c) Macroeconomic Variables

Gross domestic product (GDP) and economic crisis are added to reflect the macroeconomic factors. Malaysia experienced the economic downturn in 1997 and 1998. Therefore, these variables are included to control the factors that could influence capital investment behaviour.

In order to capture the Asian currency crisis during 1997 to 1998, two more variables (y97 and y98) are included. The variables represent the period of economic turbulence which is likely to affect the business activities.

Research Model

The research model is adopted and extended from Black *et al.* (2000). Unlike Black, we further classify the individual rates into resident and non-resident individual tax rates. We also include seven more variables to accommodate the economic environment in Malaysia. The model is estimated using the panel data regression technique in the following form.

$$\text{INV}_{it} = a_0 + a_1 \text{CR}_t + a_2 \text{RIR}_t + a_3 \text{NIR}_t + a_4 \text{CRC}_t + a_5 \text{RIRC}_t + a_6 \text{NIRC}_t + a_7 \text{MBR}_{it} + a_8 \text{DE}_{it} + a_9 \text{DP}_{it} + a_{10} \text{CINT}_{it} + a_{11} \text{SIZE}_{it} + a_{12} \text{LINV}_{it} + a_{13} \text{GDP}_t + a_{14} \text{DICP}_{it} + a_{15} \text{DIP}_{it} + a_{16} \text{DTS}_{it} + a_{17} \text{DPROP}_{it} + a_{18} \text{DPLN}_{it} + a_{19}y97 + a_{20}y98 + \mu_i + e_{it}$$

Where:

- INV_{it} = measure of capital investment for firm i , at time t .
- CR_t = corporate tax rate at time t .
- RIR_t = average resident individual tax rate at time t .
- NIR_t = non-resident tax rate at time t .
- CRC_t = categorical variable of whether the corporate tax rate was reduced.
- RIRC_t = categorical variable of whether the average resident individual tax rate was reduced.
- NIRC_t = categorical variable of whether the non-resident individual tax rate was reduced.
- MBR_{it} = market-to-book ratio for firm i , at time t .
- DE_{it} = debt-to-equity ratio for firm i , at time t .

DP_{it}	=	dividend payout ratio for firm i , at time t .
$CINT_{it}$	=	capital intensity ratio of firm i , at time t .
$SIZE_{it}$	=	measure of the size of firm i , at time t .
$LINV_{it}$	=	lagged measure of investment for firm i , at time t .
GDP_t	=	gross domestic product at time t .
$DICP_{it}$	=	dummy measure of consumer product industry.
DIP_{it}	=	dummy measure of industrial product industry.
DTS_{it}	=	dummy measure of trading and services industry.
$DPROP_{it}$	=	dummy measure of properties industry.
$DPLN_{it}$	=	dummy measure of plantation industry.
$y97$	=	dummy measure of economic crisis in 1997.
$y98$	=	dummy measure of economic crisis in 1998.
μ_i	=	random disturbance related to cross-sectional, specific component (time-invariant) assumed to be normally distributed with constant variance.
e_{it}	=	error term assumed to be normally distributed with constant variance (the remainder effects).

Result and Discussion

An Overview of the Tax Rates Changes

There were several changes in corporate tax rate in Malaysia. Prior to the year of assessment 1989, the corporate tax rate was 40 percent consistently. Then, the rate was slightly reduced to 35 percent for the year of assessment 1989 until year of assessment 1992. In year of assessment 1993, the rate was decreased to 34 percent. The reduction was then continued to 32 percent in year of assessment 1994. For a period of three years, which is from year of assessment 1995 to 1997, the corporate tax rate was reduced again to 30 percent. From year of assessment 1998 onwards, the rate is constant at 28 percent.

As the reduction in corporate tax rate, the resident individual tax rate also experiences the same circumstance. Table 3 presents the individual tax rates in a progressive manner from year of assessment 1985 onwards. Additionally, the average tax rates of resident individual have also been presented.

For non-resident individuals, the income tax rate is in flat rate mode. The rate was reduced in year of assessment 1989 from 40 percent to 35 percent. It was maintained until year of assessment 1992. In year of assessment 1993, the rate was decreased for the second time to 34 percent. The reduction occurred again in year of assessment 1994 to 32 percent. For year of assessment 1995 to 2000 (prior year basis), the rate was 30 percent. The income tax rate was reduced in year of assessment 2000 (current year basis) to 29 percent. The rate was constant until year of assessment 2001. From year of assessment 2002 onwards, the tax rate is 28 percent.

Table 3: Resident Individual Tax Rates

Year of Assessment	1985 - 1990			1991 - 1992			1993 - 1994			1995			1996 Onwards	
	Chargeable Income	RM	Tax Rates (%)	Tax Payable (RM)	Tax Rates (%)	Tax Payable (RM)	Tax Rates (%)	Tax Payable (RM)	Tax Rates (%)	Tax Payable (RM)	Tax Rates (%)	Tax Payable (RM)		
First Next On	2,500 2,500 5,000	5 8	125 200 325	4 7	100 175 275	2 5	50 125 175	0 3	0 75 75	0 75 75	0 2	0 50 50		
Next On	5,000 10,000	12	600 925	10	500 775	8	400 575	6	300 375	4	200 250			
Next On	10,000 20,000	15	1,500 2,425	12	1,200 1,975	10	1,000 1,575	7	700 1,075	6	600 850			
Next On	15,000 35,000	20	3,000 5,425	17	2,550 4,525	15	2,250 3,825	12	1,800 2,875	10	1,500 2,350			
Next On	15,000 50,000	25	3,750 9,175	22	3,300 7,825	21	3,150 6,975	18	2,700 5,575	16	3,400 4,750			
Next On	20,000 70,000	30	6,000 15,175	27	5,400 13,225	26	5,200 12,175	23	4,600 10,175	21	4,200 8,950			
Next On	30,000 100,000	35	10,500 25,675	32	9,600 22,825	31	9,300 21,475	28	8,400 18,575	26	7,800 16,750			
Next On	50,000 150,000	40	20,000 45,675	35	17,500 40,325	34	17,000 38,475	31	15,500 34,075	29	14,500 31,250			
Exceeding Average	150,000	40	30	35 27	34 26			32 23	32 23	30 21				

Cont'd

Cont'd Table 3: Resident Individual Tax Rates

Year of Assessment		2000(cyb) - 2001		2002 Onwards	
Chargeable Income	RM	Tax Payable (%)	Tax Rates (RM)	Tax Payable (%)	Tax Rates (RM)
First	2,500	0	0	0	0
Next	2,500	1	25	1	25
On	5,000		25		25
Next	5,000	3	150	3	150
On	10,000		175		175
Next	10,000	5	500	3	300
On	20,000		675		475
Next	15,000	9	1,350	7	1,050
On	35,000		2,025		1,525
Next	15,000	15	2,250	13	1,950
On	50,000		4,275		3,475
Next	20,000	20	4,000	19	3,800
On	70,000		8,257		7,275
Next	30,000	25	7,500	24	7,200
On	100,000		15,775		14,475
Next	50,000	28	14,000	27	13,500
On	150,000		29,775		27,975
Next	100,000	29	29,000	27	27,000
On	250,000		58,775		54,975
Exceeding	250,000	29		28	
Average		24		22	

(Source: 2002 Budget Commentary & Tax Information)

Descriptive Statistics

The data which was collected from the annual reports was analyzed using descriptive statistics. Table 4 presents the means for the continuous dependent and independent variables which are employed in the regression model.

Table 4: Continuous Regression Variables – Means (n = 1320)

Capital investment (INV)	3.76
Corporate tax rate (CR)	0.33
Resident individual average tax rate (RIR)	0.26
Non-resident individual tax rate (NIR)	0.33
Market-to-book ratio (MBR)	4.84
Debt-to- equity ratio (DE)	10.78
Dividend payout ratio (DP)	0.15
Capital intensity ratio (CINT)	2.36
Size (SIZE)	17.95
Lagged of investment (LINV)	4.12

The mean of the capital investment shows that, on average, the capital investment incurred by the companies during the period observations is 3.76. The average corporate tax rate, resident individual average tax rate and non-resident individual tax rate of the observations is 33 percent, 26 percent and 33 percent respectively. The mean for market to book ratio displays that, on average, the market value of the companies' shares is 4.84 higher than the book price of the shares. In explaining the debt to equity ratio, the mean shows that, from the observations, the companies need RM10.78 debt to finance each ringgit of their equity. The mean of the dividend payout ratio displays that on average, 15 percent of the net earnings of the companies are declared as cash dividends during the period of observations. The capital intensity ratio explains that the average companies' gross property plant and equipment is 2.36 higher than their total assets which indicates high capital intensity. In explaining the size of the companies, the mean shows that, on average, the size of the companies (based on total asset) is 17.95. In terms of lagged investments, an immediate prior year's capital investments is 4.12 higher than total sales of the current year.

Panel Regression Results

The model of this research was tested for model specification and heteroskedasticity. Overall, the model fits and is significant at less than 0.0001 with a χ^2 value of 2250.39 and the R^2 of 0.63. However, this model faces the heteroskedasticity problem. Therefore, the robust result (after corrected for residual problems) was utilized. The panel data regression with robust option overcomes problems with residual assumptions. Table 5 reveals the regression result of the model.²

The result is supportive of the hypotheses in which there are significant influences of non-resident individual tax rate reduction and corporate tax rate. Non-resident individual tax rate reduction is negatively associated with capital investment behaviour and it is significant at 10 percent level. This result supports the hypothesis H_6 of the negative association between non-resident individual tax rate reduction and capital investment. Tax savings might be the underlying reason of this result. When there is a reduction of non-resident individual tax rate, the direct implication is tax savings. The excess amount could be utilized by making investment in the companies. Thus, companies could enlarge their capital investment using those funds.

In line with non-resident individual tax rate reduction, corporate tax rate is also negatively associated with capital investment ($p < 0.05$). It shows that high corporate tax rate will reduce the capital investment and thus, it supports the H_1 . This may be because of the reduction of the owner's wealth as claimed by Mintz (1981). This situation also applies for Malaysian environment as supported by this finding.

Table 5: Panel Data Regression Results (n = 1320)

Independent variable	Expected sign	Coefficient	P> z
Intercept	?	-2.28	0.86
CR	-	-35.26	0.04
RIR	-	77.64	0.10
NIR	-	Dropped*	
CRC	-	3.76	0.11
RIRC	-	3.19	0.19
NIRC	-	-5.86	0.08
MBR	?	-0.03	0.04
DE	?	0.0001	0.38
DP	?	0.003	0.15
CINT	?	0.004	0.47
SIZE	?	-0.16	0.37
LINV	?	0.59	0.00
GDP	?	-1.95	0.65
DICP	?	-2.18	0.28
DIP	?	-3.25	0.12
DTS	?	-1.66	0.33
DPROP	?	-3.46	0.01
DPLN	?	-2.53	0.05
y97	?	4.05	0.22
y98	?	Dropped*	
Chi-sq (17)		1562.06	0.000

Note: see variable description in Section 6.3. One-tailed test is used for variables with one-way predicted directions, and two-tailed test otherwise.

* Variable is dropped by the procedure due to collinearity.

The third significant ($p < 0.1$) result of this regression model is the impact of resident individual tax rate on capital investment behaviour. However, the direction contradicted the expectation in which there is a positive association between resident individual tax rate and capital investment.

This might be due to attractive tax shield attributable to the dividend imputation system. According to Section 110 Income Tax Act 1967, the individual who received taxable dividends will enjoy tax credit. Although the resident individual tax rates increase, it would not reduce their investment in the company since they could claim for the tax credit on dividend. Therefore, this result fails to support the H_2 in explaining the indirect effect of individual tax rate on capital investment through net dividend income received.

In addition to the above results, the analysis also indicates positive relationship between reduction in corporate tax rate and reduction in resident individual tax rate with capital investment behaviour. However, the results are not significant ($p > 0.10$). Thus, the results fail to support H_4 and H_5 . Furthermore, the findings also fail to support H_3 since the non-resident individual tax rate was dropped due to collinearity³. The procedure automatically drops the variable due to statistical reason. In fact, control variable of year 1998 is also dropped due to the same problem.

In other words, the non-resident individual tax rate is much related to other tax rates variables and has no differences. Thus, it is dropped because there is no need to run the variables that has no statistical differences. The same reason applies for control variable of year 1998, which is much related with year 1997. The statistic procedure will automatically detect the problem. As for the study, there was no major effect except that these variables cannot explain the capital investment decision.

In the case of firm specific variables, the results indicate significant relationship between market to book equity ratio and lagged investment with capital investment behaviour. Market to book equity ratio is negatively associated ($p < 0.05$) with capital investment. Lagged investment is positively related to the capital investment and it is significant at one percent level. For industry variable, only properties and plantation industries are found negatively significant associated with capital investment at one percent and five percent respectively. This is related to high property, plant and equipment utilization among these industries as compared to the others such as machinery used for harvesting the agriculture product. In addition, the government also provides higher agriculture allowance on qualifying capital expenditure incurred for the purpose of the plantation. Therefore, there is likelihood for companies in plantation industry to have higher PPE utilization.

To conclude, corporate tax rate and non-resident tax rate reduction were found to be negatively associated with corporate capital investment. These are in line with the previous literatures in discussing the influence of tax rates on capital investment (e.g. Hall and Jorgensen, 1967; Junge and Zarinnejad, 1986 and Mintz, 1981). However, in the case of average resident individual tax rate, a different direction is found. This finding supports the preference theory that explains the intuitive sense in reflecting items that cause lower

effective tax rates (Wilkie, 1988). Based on the result, the authorities especially the Ministry of Finance, should note that tax rates could be associated with capital investment. Hence, it seems like the reduction of corporate and non-resident individual tax rates could contribute to the growth of the economy. However, the reduction should be at the best possible level in order to ensure reasonable tax collection.

Further Analysis

Further tests were conducted to reveal the result of the tax-rates-only model and the tax-reduction-only model. The results of both models seem to be sensitive to the model specification and thus, it should be interpreted with caution.

Conclusion, Limitation and Future Research

This study seeks to investigate the influence of tax rates and tax rate reductions on capital investment behaviour. Both corporate and individual (resident individual tax rate and non-resident individual tax rate) tax rates were investigated. The results provide empirical evidence on the relationship between tax rates and tax rates reductions on capital investment. However, the results are not conclusive since they only support the hypotheses which predict a negative relationship between corporate tax rate and non-resident individual tax rate reduction with capital investment. In other words, it might be presumed that companies intend to increase their capital investments when they have tax saving advantage. This presumption is in line with Junge and Zarinnejad (1986) in which they found significant impact of taxes on investment. This presumption is also in the same direction with Hall and Jorgenson (1967) where they claimed that tax policy changes have a significant impact on corporate investment. As supported by the findings, a similar situation might happen in the Malaysian environment.

In explaining the negative relationship between average resident individual tax rate, non-resident individual tax rate, corporate tax rate reduction and average resident individual tax rate reduction with capital investment, the results failed to support the hypotheses. In terms of control variables, market-to-book equity ratio and lagged investment are found to be significantly affecting the capital investment behaviour. This shows that companies do not utilize the investment opportunities available at the moment. In the case of lagged investment, capital investment behaviour tends to correlate with the prior year's trend. This is in line with the findings by Black *et al.* (2000). Besides market-to-book equity ratio and lagged investment, properties and plantation industries are significantly correlated with capital investment. This is because of the different pattern of capital utilization of these industries as compared to the others.

Even though the results of the full model are quite supportive, the tax-rates-only model and tax-reduction-only model are quite sensitive to the model specification. This requires careful interpretation since it could not be concluded if separately analyzed. Further limitation is related to the sample data in which it only concentrates on listed companies

at Bursa Malaysia. Therefore, there result should be interpreted with care since it could not be generalized to the population. Hence, future research should try to analyze the issue in a broader aspect of companies so that it could explain the capital investment behaviour across multiple sizes and categories of companies. In addition, a new variable could be tested to explain further on the factors of capital investment made by the companies such as incentive offered by the government.

Notes

- 1 The Economic Recovery Tax Act 1981 offers several provisions, which consist of Accelerated Cost Recovery System, modifications of Investment Tax Credit, modifications of the Rehabilitation Investment Credit, extension of the Net Operating Loss carryover time period and safe harbor leasing.
- 2 Note that the earlier (uncorrected) results were qualitatively similar. In fact, more hypothesis variables were significant in the earlier version and the significant levels were more pronounced. However, for the purpose of hypothesis testing, the corrected version is used.
- 3 The variables are dropped since they have high correlation with other independent variables. Hair, Black, Babin, Anderson and Tatham (2006) addressed that the collinearity may reduce the unique variance explained by each independent variable.

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