CORPORATE EFFECTIVE TAX RATES: A STUDY ON MALAYSIAN PUBLIC LISTED COMPANIES

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Abstract

This study examines corporate effective tax rates (ETRs) of large Malaysian listed companies during the new tax regime, and further investigates the relationship between corporate ETRs and their attributes. The goal of this study is to compare the effective tax rate effectively experienced by each company within and across sectors, and to provide evidence for factors that cause corporate ETRs to diverge from the statutory tax rate (STR). Using a micro backward-looking approach from a balanced panel sample of 294 companies (1470 firm-years) for the years 2000 to 2004, the study provides evidence for the variability of corporate ETRs within and across sectors in which the average corporate ETRs falls below the STR of 28%. The statistical results indicate that companies that face higher ETRs are from properties, trading and services and constructions sectors. The statistical results also reveal that lower ETRs are associated with highly leverage companies, greater investments in fixed assets and extensive foreign operations. Further, a negative coefficient for return on assets suggests that companies have benefited from tax incentives provided by the government. However, the finding provides support for the political cost theory, which suggests that larger companies face higher ETRs. Hence, this study contributes to tax literature and policymakers on the impact of tax incentives of corporate ETRs and determinants of corporate ETRs.

Keywords: *effective tax rates, statutory tax rate, tax incentives, public listed company and new tax regime.*

Introduction

This study examines corporate income tax burdens, specifically known as corporate effective tax rates (ETRs) and to provide evidence for factors that cause corporate ETRs to diverge from the statutory tax rate (STR). A study on the variability of corporate ETRs is important for understanding the impact of a tax policy on corporate actual tax burdens (Gupta and Newberry, 1997; Molloy, 1998). As income taxes represent one of the costs of doing business, the level of corporate effective income tax rates may affect the savings rate and the cost of business, and consequently, the economic growth in a particular country (Molloy, 1998). Hence, tax policy is one of the important factors which contributes to a country's inflow and outflow of capital.

Evidence about the variability of corporate ETRs across companies and over time raises issues of inequality and non-neutrality of the corporate tax system (Gupta and Newberry, 1997; Nicodeme, 2001; Buijink, Janssen Schols, 2002; Janssen, 2005). According to Slemrod (2004), the dispersion of ETRs from the statutory tax rate began to decline in 1980s and continued at least until 1995 due to increased international pressure for tax competition. Further, Spooner (1986) stated that one of the driving forces behind the tax reform in the 1980s was the concern about many large companies were not paying their fair share of taxes. In U.S, evidence that tax burdens vary across corporate taxpayers due to tax incentives provided to certain economic activities has prompted long standing public concern as to whether these taxpayers pay their fair share of taxes (Wilkie and Limberg, 1993).

Like other countries, Malaysia has experienced several phases of tax reforms due to global tax competitions. The tax system is used as a mechanism to achieve the country's economic growth. The changes in tax laws and provision of tax incentives in a form of reduction in the statutory tax rate, exemptions, deductions and exclusions are reflected in corporate tax burdens. Special tax incentives and tax treatments to selected industries create inequity and non-neutrality in the tax system. The tax incentives which lower the cost of corporations operating in a favoured industry can be hidden within the complexity of the tax laws. These differences cannot be ascertained by comparing the statutory rate, thus ETRs must be used. Therefore, ETR is used to measure the impact of changes in the tax policy on companies' tax burdens. Hence, corporate ETR has been an important measure of corporate tax burdens for policymakers and academic researchers for several decades (Molloy, 1998).

Previous studies on corporate ETR have been conducted in developed countries such as U.S., E.U, Australia. The motive is to examine the extent of equity and neutrality of the corporate tax system. However, no prior studies have been conducted in Malaysia to address this issue especially in the new tax regime. Thus, the goal of this study is to address the shortcoming. Using a balanced panel data of 294 listed companies (1470 firm-years) for the years from 2000 to 2004, the objectives of this study are: (1)) to examine the level of corporate ETRs of Malaysian large listed companies within and across sectors; and (2) to examine the determinants of corporate ETRs, i.e. the relationship between corporate ETRs and their attributes. Therefore, the research questions address in this study are:

(1) What is the impact of tax incentives on corporate effective tax rates?
(2) What are the factors that cause corporate effective tax rates to diverge from the statutory tax rate?

The remainder of this paper is organized as follows. Section 2 discusses the previous research related to the study. Section 3 describes the research design and data collection used in this study. Section 4 analyses the findings and the last section summarizes and concludes the main results.

Previous Research

Determinants of Corporate Effective Tax Rates

Substantial amounts of prior research have examined corporate effective tax rate (ETR) as a measure of corporate actual tax burdens. For example, Stickney and McGee (1982) investigated the causes for differences in corporate tax burdens. They found that capital intensity and leverage create variation in ETRs across companies. They also found that foreign operations and size are less important determinants of ETRs. Further, Wilkie (1988) argues that pre-tax income is an important determinant for the variation in corporate tax burden. In addition, Gupta and Newberry (1997) investigated other determinants of corporate ETRs, including investments in inventory using panel data. They found ETRs are systematically related to a company's capital structure and return on assets was an important determinant for corporate ETRs.

The relationship between ETRs and certain company characteristics are consistent across ETR studies. For instance, Gupta and Newberry (1997) and Mills, Erickson and Maydew (1998), each document a negative relation between ETRs and leverage, and between ETRs and capital intensity. On the other hand, the evidence about the relation of ETRs to other company's characteristics, such as company size, profitability and foreign operations is inconsistent across studies. Company size is the most controversial variable examined in prior ETR research. Further, extant literature argued that larger companies should have lower ETRs than smaller companies due to greater resources with which to (1) influence the political process, (2) develop expertise in tax planning, and (3) organize their activities in optimal tax savings ways (Rego, 2003). Thus, ETRs can be considered a measure of tax planning (Rego, 2003; Hanlon, 2003, Desai and Dharmapala, 2006).

In previous research, tax incentives have been modelled as a function of a company's size and of a company's operating, financing and investment decisions. Sansing (1998), Holland (1998) and Desai (2003) suggested that larger companies will, because of their larger political visibility, have fewer tax incentives available to them than smaller companies. Therefore, they expected a positive effect of company size on ETRs. While, Hanlon (2003) evidenced a negative effect of company size on ETRs due to larger companies having more tax expertise or have more political clout to obtain advantageous tax incentives. However, Gupta and Newberry (1997) and Mills et al. (1998) did not find any link. Differences in results may have been attributed to sample selection, ETR definition and time period under investigation.

Additionally, capital structure or leverage can inversely affect ETRs because interest expenses are tax deductible, whereas dividends paid to shareholders are not tax deductible (Hanlon, 2003). Further, asset mix may also have a significant impact (inverse relationship) on companies' ETRs due tax benefits provided for capital investment, such as investment tax credit and accelerating capital allowance (Gupta and Newberry, 1997). In addition, the extent of foreign operations influences ETRs through tax credits extended for foreign profits earned in more lightly taxed environments (Harris and Feeny, 2000; Bauman and Schadewald, 2001). Thus, prior researchers have also included the extent foreign operations undertaken by a company in the ETR determinants regression model as an explanatory variable. They found an inverse relationship between the extent of foreign operations and company ETRs and suggest that companies used foreign operations to lower their ETR.

Corporate Tax Reform in Malaysia

Like other countries, Malaysia has undertaken several tax reforms due to global tax competitions. Pinto (1998) cited in Buijink et al. (2000, p. 5) defined tax competition "as the improvement of a country's national economy (relative to foreign jurisdictions) by lowering the tax burden imposed on taxpayers in order to increase the competitiveness of domestic business and to attract foreign direct investments". Thus, an increase in corporate tax competition will lead the government to reform the tax system in order to attract new investors, especially foreign direct investors as well as to retain present investors (Buijink et al. 2002).

The tax competition strategy can be achieved either by amending the corporate tax laws, such as lowering the statutory tax rate (STR), or by providing tax incentives to specific sectors, e.g. investment tax credit and pioneer status. However, the general tax competition's strategy of lowering the corporate income tax rate will reduce company ETRs, thus, having a negative impact on the government's revenues. On the other hand, the targeted tax competition strategy of providing tax incentives to certain economic activities will only benefit certain companies. Hence, the targeted tax strategy would increase inequitable tax treatment as some companies will bear lower ETRs as other companies. Thus, the preferential tax treatment might influence companies' investment decisions and was considered undesirable by European Union (EU) Finance Ministers (Buijink et al., 2002).

In line with the global tax reforms, Malaysia's tax reforms focus on corporate tax system. Corporate tax generates about seventy percent of total income tax revenue for this country. The ultimate advantage of the corporate tax reforms is to reduce the cost of doing business, thus increasing the firm's value (Lua and Swenson, 2004; Desai and Dharmapala, 2005). Among the strategies of tax reform is a gradual reduction in the corporate statutory tax rates from 40% in 1988 to 28% in 2004. This is in line with the reduction of the corporate income tax rates by the U.S government and other countries.

Further, various tax incentives are provided by the government to facilitate the economic growth of this country. The tax incentive is structured according to the business sectors or activities, such as manufacturing, trading, agricultural, tourism, research and development, education, communications, utilities and transportation, high technology

and multimedia, service, waste recycling sector and special incentives for promoted areas (MIA, MIT & MICPA 2004). The incentives offered are in the form of pioneer status, investment tax allowance, reinvestment allowance, double deduction of expenses, exemption of foreign income, abatement of adjusted income, export allowance, infrastructure allowance, industrial adjustment allowance, accelerated capital allowances, exemption of import duties and sales tax and group relief adjusted loss (see Appendix 1).

The tax incentive is provided for the purposes of, not only to promote certain economic activities, but also for other social objectives of this country. Appendix 1 shows that different sets of tax incentives are provided to each business activity or sector, which some sectors benefitted more than the others. Thus, unequal distributions of tax incentives and other tax provisions given to various sectors may result in different companies paying a different effective tax rate (Spooner, 1986). Therefore, it is important to examine the impact of these tax incentives on corporate ETRs at macro level, so as to assess the equity and the neutrality of the corporate tax system.

Research Methodology

Sample Selection

The data used in this study are taken from Thomson data stream, Thomson one-banker and companies' annual reports. The data are collected from the period 2000 to 2004, the period where Malaysia imposed a new tax regime on current year assessment system (effective from the year 2000) and self-assessment system (effective from the year 2001). The sample consists of companies from ten sectors listed on the main and second board of Bursa Malaysia, which includes industrial products, trading and services, consumer products, properties, plantation, construction, technology, infrastructure, hotel and mining sectors. Companies with non-industrial templates are removed. These include banks, insurance companies, trust and other financial companies.

Further, to create the 2000-2004's panel data, companies must have non-missing financial information for all the five years of the investigation periods. The short length of the panel reduces the chance of survivorship bias affecting the results (Feeny, Harris and Gilman, 2002). Thus, the exclusion of companies with insufficient data resulted in a final sample of 294 companies (1470 firm-years) used in this study. The use of panel data is important in this study, as it allows for the simultaneous conditioning of the observed and unobserved company characteristics which also affect the variations in corporate ETRs (Feeny et al., 2002). Examples of companies' unobserved characteristics are management strategy, tax specific effects and corporate culture.

Measurement of Effective Tax Rates

Previous studies have used various methods for measuring corporate ETRs, where the numerator is the measure of a company's tax liability and the denominator is the measure of its income (Plesko, 2003). However, the current study uses a micro backward-looking

looking approach to examine the variability of corporate ETRs. Thus, the financial statements-based ETR is measured using company-level data. In other words, the numerator is the tax expense, a proxy for income tax burdens paid or payable by the company; and the denominator is pre-tax income, a proxy for company's taxable income. Two ETR measures are used as a dependent variable to improve robustness of the empirical results (Kim and Limpaphayom, 1998). The first measure is ETR1, defined as the ratio of current income tax expense divided by income before interest and taxes. The second measure is ETR2, defined as the ratio of total income tax expense (current tax expense plus deferred tax expense) divided by income before interest and taxes. Hence, ETR2 measure considers future tax liability arising due to temporary difference between financial accounting income and taxable income.

Data Filtering

The sample data used in this study include companies with negative pre-tax income (operating losses) and negative tax expense (tax refund). Following Gupta and Newberry (1997) and Buijink et al. (2002), the data are filtered as follows: (1) Companies having negative income before interest and tax are deleted from the sample; (2) Companies having negative tax expense which produced negative ETR are recoded as '0'; and (3) companies with an ETR above 100% i.e. companies tax expense exceed income before interest and tax are recoded as '100'. The data filtering is necessary as ETRs do not have any economic meaning whenever its denominator, that is, the income is zero or negative (Wilkie and Limberg, 1993).

Empirical Model and Variable Definitions

The empirical analysis in this study uses the following general multivariate model. The company subscript **i** is omitted. The ETR model is estimated for ETR1 and ETR2.

$$ETR_t = \beta 0 + \beta 1 SIZE_t + \beta 2 LEV_t + \beta 3 CAPINT_t + \beta 4 ROA_t + \beta 5 INVINT_t + \beta 6 FOROPE_t + \beta 7 MNC_t + \epsilon_t$$

where **ETR** refers to ETR1, measured as current income tax expense divided by income before interest and taxes, and ETR2, measured as total tax expense (current income tax expense plus deferred tax expense) divided by income before interest and taxes; **β0** is the constant; **β1SIZE** is a firm size measured as log of total assets; **β2LEV** is a firm leverage measured as long term debts divided by total assets; **β3CAPINT** is capital intensity measured as fixed assets divided by total assets; **β4ROA** is return on assets measured as pre-tax income divided by total assets; **β5INVINT** is inventory intensity measured as inventory divided by total assets; **β6FOROPE** is foreign operation measured as foreign sales divided by total sales; **β7MNC** is multinational corporations, dummy variable that is 1 when a firm reports foreign assets and 0 otherwise; **ϵ** is an Error term; **t** is the firm-years between 2000 to 2004.

Panel Data Estimation Procedures

Most of previous ETRs studies are based on a simple pooled cross-sectional or time series models. However, Gupta and Newberry (1997) and Feeny et al. (2002) have used fixed effects and random effects models to determine the relationship between corporate ETRs and their characteristics, and the results indicated that these models provide better specification estimates. The fixed effects and random effects specifications consider both companies' observed and unobserved heterogeneity in the multivariate regression model. Further, these models consider the possible non-linear relationship between ETR and its determinants, as well as, to control for the possible non-normal distribution of financial accounting data.

In a fixed effects model, the data are assumed to be not randomly distributed and the unobserved company-specific characteristic are correlated with the included explanatory variables. Therefore, a fixed effects model accounts for individual company heterogeneity via company-specific constants in the model which capture the effects of unmeasured company characteristics that vary by company, but relatively stable over time for a given company (Gupta and Newberry, 1997; Feeny et al., 2002). However, a fixed effects model produces parameter estimates which are sample-specific; so inferences are not generalizable outside the sample.

On the other hand, a random effects model accounts for individual-specific characteristic as a normally-distributed random variable and assumes that the individual-specific effects are uncorrelated with the regressors. In this model, the intercept $\beta 0$ represents the mean value of all the cross-sectional intercepts and the error component ϵ_i represents the random deviation of individual intercepts from the mean value. Whereas, in a fixed effects model, each cross-sectional unit has its own fixed intercept value (Gujarati, 2003). Therefore, this study uses a fixed effects model, random effects model and pooled OLS model to estimate the coefficient for each of the explanatory variables and the results are compared as robustness check.

Empirical Results

Negative/ Zero Tax Expense and Negative/Zero Pre-tax Income

Table 1 presents the occurrence of companies that reported negative tax expense, zero tax expense, negative pre-tax income (operating losses) and zero pre-tax income for the period from 2000 to 2004. Negative tax expense arises when a company is entitled for a tax refund from the government. Further, negative tax expense reported by companies could also be due to deferred tax credit. Deferred tax credit arises as a result of reversion of temporary differences from previous years, or current year provision for future tax refundable due to temporary differences between financial reporting and tax reporting. The study found that from 2000 to 2004, about 9.84% (2001) to 11.97% (2004) of companies reported a negative tax expense. While, companies with negative income (operating losses) ranged between 22.87% (2004) to 31% (2001), and the percentage of companies paying no tax (or zero tax) is very low during the study period i.e. between 4.77% (2001/2002) to 11.43% (2000).

Table 1: Occurrence of Negative/Zero Tax Expense/Pretax Income for Year 2000 - 2004

Year	N	Negative Tax	Negative Income	Zero Tax	Zero Income
2000	560	65 (11.61%)	145 (25.89%)	64 (11.43%)	2 (0.36%)
2001	671	66 (9.84%)	208 (31.00%)	32 (4.77%)	0
2002	713	82 (11.50%)	204 (28.61%)	34 (4.77%)	0
2003	736	78 (10.60%)	194 (26.36%)	42 (5.71%)	0
2004	732	90 (11.97%)	172 (22.87%)	45 (5.98%)	6 (0.80%)

Distribution of Corporate ETRs

The distribution of corporate ETRs is presented in Table 2. Gupta and Newberry (1997) classified corporate ETR into three categories as follows: (1) ETRs less than 10% is classified as low; (2) ETRs between 10% to the top statutory tax rate is classified as normal; and (3) ETRs above the statutory is classified as high. This study found that distribution of corporate ETRs for 294 companies (1470 firm-years) for the years 2000 to 2004 are as follows: (1) about 29% of companies paid effective tax below 10% for ETR1, and 18% for ETR2; (2) 48% of the companies paid effective tax between 11% to 28% i.e. the top statutory tax rate for ETR1, and 58% for ETR 2; and (3) 23 % of the companies paid effective tax above the statutory tax rate for ETR1, and 24% for ETR2.

Table 2: Distribution of Corporate ETRs for Year 2000 to 2004

ETR Range	ETR1	ETR2
Firm-years	1470	1470
	%	%
0% - 10%	29	18
11% - 28% (STR)	48	58
> 28%	23	24
Total	100	100

Descriptive Statistics and Univariate Analysis

Table 3 tabulates descriptive statistics for both ETR measures. The mean for ETR1 is 20.4%, and ETR2 is 22.49%. While, the median for ETR1 is 20.71% and ETR2 is 22.91%. The mean and median for both ETR measures are below the statutory tax rate. The study found that the mean and median for ETR2 are slightly higher than ETR1: This is due to the provision of future tax liability which is included in the tax expense (numerator) of ETR2. The standard deviations (ETR1:16.35; ETR2:14.59) exhibit considerable variations in ETRs between companies in the sample for both ETR measures.

Table 3: Descriptive Statistics for Year 2000 - 2004

	ETR1	ETR2
Mean	20.40	22.49
Median	20.71	22.91
Standard Deviation	16.35	14.59
Minimum	0.00	0.00
Maximum	100	100
Firm-years	1470	1470

Note:
Variable definitions are as follows:
ETR1 = current income tax expense / income before interest and taxes;
ETR2 = total tax expense (current income tax expense plus deferred tax expense) / income before interest and taxes.

Figure 1 depicts the mean for ETR1 and ETR2 for the years from 2000 to 2004. Figure 1 shows that the yearly mean for ETR1 (ETR2) ranges from 19.25% (21.29%) to 22.01% (23.82%) during the five years of the investigation period. Further, the results for post-hoc tests indicate that at 1%-level, there is no significant difference of ETR mean during the five years, the *f-value* for ETR1 is **1.505** (ETR2 is 1.144) and *p-value* for ETR1 is **0.198** (ETR2 is 0.334). Thus, the findings suggest that the average annual income tax burdens for the sample companies is quite consistent throughout the years 2000 to 2004.
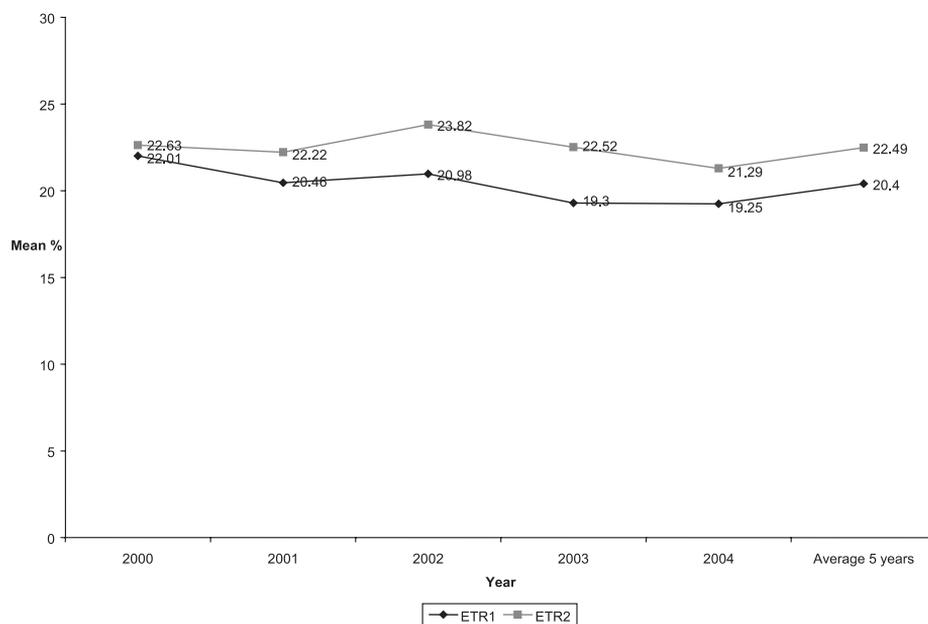

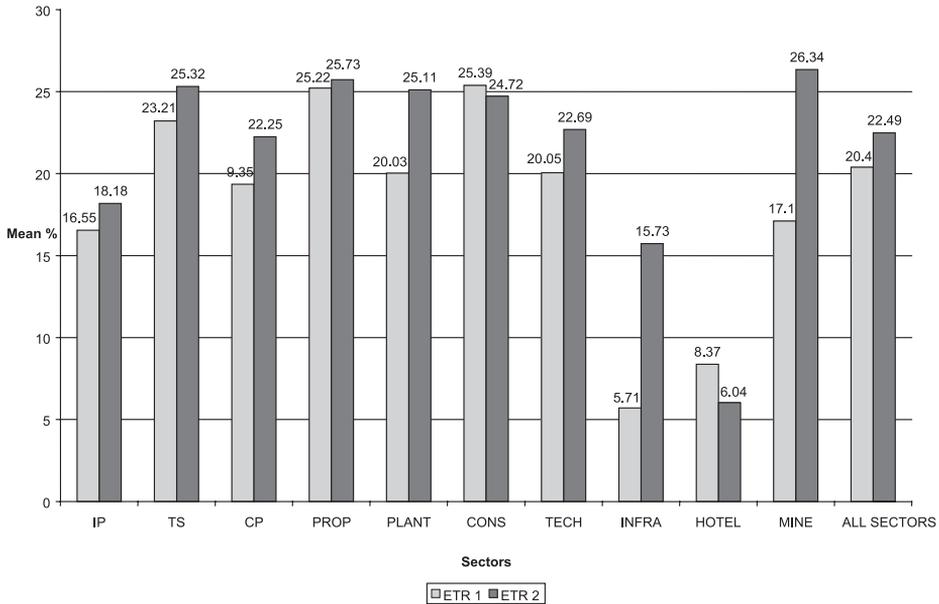Figure 1: Means for ETR1 and ETR2 for Year 2000 - 2004

Figure 2: Means for ETR1 and ETR2 by Sector for Year 2000 - 2004

Next, the mean for ETR1 and ETR2 from various sectors are presented in Figure 2. This study found that corporate ETRs vary across sectors and it falls below the statutory tax rate of 28%. For ETR1, infrastructure sector reports the lowest mean at 5.7%, and the highest ETR1 mean is reported by companies from properties and construction sectors, each at about 25%. Meanwhile, ETR2 reports the lowest mean at 6% for companies from hotel sector, and the highest ETR2 mean for companies from trading and services, properties and plantation, each at about 25%; and mining sector at 26%. Further, the results from post-hoc tests indicate that there is a significant difference for ETR mean between companies in the same sector and across sectors, that is, at 1%-level, the *f-value* is **9.486** for ETR1 (ETR2 is 9.566) and the *p-value* is **0.000** for ETR1 (ETR2 is 0.000). Hence, the statistical results support that there is variability of corporate ETRs within and across sectors during the new tax regime.

Table 4 presents the descriptive statistics for various determinants of corporate ETRs and further; Table 5 presents the Pearson correlation coefficient between the explanatory variables. The Pearson correlation results produce considerable correlations between seven explanatory variables. Most of the explanatory variables are significantly correlated and the highest correlation is reported between size and leverage, then, followed by size and capital intensity. Thus, the univariate results indicate that larger companies are also highly leveraged, and have higher investments in capital intensity.

Table 4: Descriptive Statistics for ETR Determinants for year 2000 to 2004

VARIABLE (1470 Firm-years)	MEAN	MEDIAN	STD DEV	MINIMUM	MAXIMUM
SIZE	5.63	5.57	0.76	0	7.80
LEV	0.09	0.03	0.12	0	0.75
CAPINT	0.43	0.44	0.22	0	0.97
ROA	0.08	0.07	0.06	-0.06	0.60
INVINT	0.14	0.11	0.13	0	0.75
FOROPE	6.63	0	18.18	0	105.22
MNC	0.29	0	0.45	0	1.00

Table 5: Pearson Correlation for ETR Determinants for Year 2000 - 2004

	SIZE	LEV	CAPINT	ROA	INVINT	FOROPE	MNC
SIZE							
LEV	**0.388						
CAPINT	**0.254	**0.266					
ROA	-0.002	**-0.202	**-0.195				
INVINT	**-0.098	**-0.167	**-0.287	0.016			
FOROPE	**0.129	0.015	*-0.045	**-0.079	-0.020		
MNC	**0.204	**0.127	0.013	**-0.094	0.013	**0.384	
FIRM-YEARS	1470	1470	1470	1470	1470	1470	1470

Note:
** Correlation is significant at the 1%-level (1-tailed)
* Correlation is significant at the 5%-level (1-tailed)

Regression Results

Fixed Effects Model Regression Results

Table 6 summarizes the fixed effects model results for ETR1 and ETR2. The results indicate that the overall explanatory powers for both ETR measures are statistically significant at the 1%-level. ETR1's measure provides very strong explanations to the variation in corporate ETRs with an adjusted R-squared of 67%. Meanwhile, ETR2 explains 47% to the variation in corporate ETRs. With regard to the individual explanatory variables, company size and return on assets provide significant coefficient estimates for both ETR measures. Both ETR measures demonstrate positive association between companies ETR and their sizes, and ETR 2 provides a stronger relationship than ETR1. The results indicate that larger companies face higher income tax burdens, thus supporting the political cost theory, instead of the political clout theory. Thus, the finding is consistent with other studies, such as Gupta and Newberry (1997) and Vandenbussche, Jabssen and Crabbe (2004).

Further, the statistical results provide a significant and negative relationship between return on assets (ROA) and company ETRs. The negative coefficient for return on assets (ROA) indicates that highly profitable companies face lower income tax burdens. Hence, the findings suggest that profitable companies utilized tax incentives and other tax

provisions to reduce their ETRs below the statutory tax rate of 28%. Thus, the results support other studies, such as Derashid and Zhang (2003). In addition, statistical results for ETR2 provide additional evidence for other explanatory variables. The results indicate significant and negative coefficient for leverage, and significant but positive coefficient for capital intensity. The negative relationship between leverage and companies ETRs suggests that large companies benefit from interest tax deductible expenses which reduce their taxable income. Further, the positive association between capital intensity and companies ETRs indicate that large companies have extensive investment in capital assets.

Table 6: Fixed Effects Model Regression Results

Model:
$$ETR = \beta 0 + \beta 1 SIZE_t + \beta 2 LEV_t + \beta 3 CAPINT_t + \beta 4 ROA_t + \beta 5 INVINT_t + \beta 6 FOROPE_t + \beta 7 MNC_t + \epsilon_t$$

Variable	ETR 1 Coefficient (t-stat)	ETR 2 Coefficient (t-stat)
SIZE	1.433	1.737
	**[2.092]	**[2.244]
LEV	-3.348	-8.931
	[-0.681]	*[-1.607]
CAPINT	-2.135	8.246
	[-0.574]	**[1.963]
ROA	-49.548	-65.909
	***[-6.055]	***[-7.129]
INVINT	-7.091	2.255
	[-1.184]	[-0.333]
FOROPE	0.006	0.015
	[0.262]	[0.607]
MNC	-1.601	-1.074
	[-1.506]	[-0.894]
Adjusted R-Squared	66.9%	46.9%
F-Statistic (P-value)	10.765 (0.000)	5.274 (0.000)
Firm (Firm-years)	294 (1470)	294 (1470)

Note:
*** Significant at the 1%-level; ** Significant at the 5%-level; and * Significant at the 10%-level. Standard errors are white heteroskedasticity consistent.

Variable definitions are as follows:
ETR1 is measured as current income tax expense divided by income before interest and taxes; ETR2 is measured as total tax expense (current income tax expense plus deferred tax expense) divided by income before interest and taxes; $\beta 0$ is the constant; $\beta 1 SIZE$ is a firm size measured as log of total assets; $\beta 2 LEV$ is a firm leverage measured as long-term debts divided by total assets; $\beta 3 CAPINT$ is capital intensity measured as fixed assets divided by total assets; $\beta 4 ROA$ is return on assets measured as pre-tax income divided by total assets; $\beta 5 INVINT$ is inventory intensity measured as inventory divided by total assets; $\beta 6 FOROPE$ is foreign operation measured as foreign sales divided by total sales; $\beta 7 MNC$ is multinational corporations, dummy variable that is 1 when a firm reports foreign assets and 0 otherwise; ϵ is an Error term; t is the firm-years between 2000 to 2004.

Random Effects Model Regression Results

Treating the individual effects as random, yields the results as presented in Table 7. Both ETR1 and ETR2 explanatory powers are significant at 1%-level. ETR1 measures explain about 47% of the changes in corporate ETRs, while, ETR2 explains 16%. Similar to a fixed effects regression results, company size and return on assets (ROA) are statistically significant for both ETRs measures. The random effects regression results observe a positive coefficient for company size, but a negative coefficient for return on assets. Further, random effects model provides additional evidence for other explanatory variables. The statistical results indicate significant and negative coefficient for leverage for both ETR1 and ETR2, and significant and negative coefficient for capital intensity and multinational corporations (MNC) for ETR1 only. Thus, the findings suggest that large companies benefit from interest deductions and investments tax credit as well as capital allowance which reduce companies ETRs. Further, the negative relationship between multinational corporations (MNC) and companies ETRs suggests that generally large companies with extensive international operations (which is proxied by foreign assets) have greater scope for adopting tax practices to reduce their ETRs.

However, the statistical results indicate that in terms of preferred specifications, it is important to account for unobserved company characteristics. According to Feeny at el. (2002), in a fixed effects model, the company dummies tend to swamp the individual effects of all the explanatory variables, which, as noted, might be the result of relatively little variation in the included variable over time, or simply that dummies are better proxies for tax shield and tax credit. On the other hand, treating these individual effects as random, suggests that leverage and capital intensity are better proxies for tax planning and tax credits, besides return on assets (ROA). However, the choice between fixed effects and random effects specification models is not obvious as indicated in the Hausman tests' results (not reported).

Robustness Checks

The empirical results on the tests performed so far are influenced by the ETR measurement and regression models. Therefore, the study provides additional sensitivity tests using a pooled cross-sectional OLS model. The results are reported in Table 8. Overall, the explanatory powers are significant for both ETR measurements at 1%-level. However, the adjusted R-squared for a pooled OLS model is much lower as compared to fixed effects and random effects models. The results are expected as a pooled OLS model does not account for unobserved companies' heterogeneity in the specifications.

Nevertheless, the statistical results from a pooled OLS model provide almost consistent results as in fixed and random effects specification models. The coefficient estimates and the direction of the association between variables are almost similar to a fixed and random effects model's results. The explanatory variables, that is, size, leverage, capital intensity and return on assets are statistically significant for both ETR measures, except for multinational corporations (MNC), in which the statistical result indicates a significant

Table 7: Random Effects Model Regression Results

Model:
$$ETR = \beta0 + \beta1SIZE_t + \beta2LEV_t + \beta3CAPINT_t + \beta4ROA_t + \beta5INVINT_t + \beta6FOROPE_t + \beta7MNC_t + \epsilon_t$$

Variable	ETR 1 Coefficient (t-stat)	ETR 2 Coefficient (t-stat)
SIZE	1.409 ***[2.553]	1.992 ***[3.375]
LEV	-12.433 ***[-3.186]	-14.731 ***[-3.564]
CAPINT	-9.772 ***[-4.085]	-2.982 [-1.216]
ROA	-35.216 ***[-5.176]	-37.698 ***[-5.178]
INVINT	1.634 [0.433]	-0.348 [-0.089]
FOROPE	0.009 [0.474]	0.01 [0.489]
MNC	-1.69 *[-1.885]	-0.946 [-0.981]
Adjusted R-Squared	46.8%	15.7%
F-Statistic (P-value)	118.329 (0.000)	25.819 (0.000)
Firm (Firm-years)	294 (1470)	294 (1470)

Note:
*** Significant at the 1%-level; ** Significant at the 5%-level; and * Significant at the 10%- l e v e l. Standard errors are white heteroskedasticity consistent.

Variable definitions are as follows:
ETR1 is measured as current income tax expense divided by income before interest and taxes; ETR2 is measured as total tax expense (current income tax expense plus deferred tax expense) divided by income before interest and taxes; $\beta0$ is the constant; $\beta1SIZE$ is a firm size measured log of total assets; $\beta2LEV$ is a firm leverage measured as long-term debts divided by total assets; $\beta3CAPINT$ is capital intensity measured as fixed assets divided by total assets; $\beta4ROA$ is return on assets measured as pre-tax income divided by total assets; $\beta5INVINT$ is inventory intensity measured as inventory divided by total assets; $\beta6FOROPE$ is foreign operation measured as foreign sales divided by total sales; $\beta7MNC$ is multinational corporations, dummy variable that is 1 when a firm reports foreign assets and 0 otherwise; ϵ is an Error term; t is the firm-years between 2000 to 2004.

and negative coefficient for ETR1 only. However, in a pooled OLS model, leverage provides the most significant variations in corporate ETRs, followed by return on assets (ROA).

In summary, higher ETRs are associated with company's size and lower ETRs are associated with highly leveraged and highly capital intensive companies. Controlling for each company's specific effects, the study provides evidence that highly profitable companies face lower ETRs. The study also found evidence that companies with greater extent of international operations should be able to reduce their ETRs. Nevertheless, the statistical

results do not provide significant evidence for inventory intensity to explain the variation in corporate ETRs. Further, the findings indicate that ETR1 measures which is based on current tax expense exhibits better explanation to the variation in corporate ETRs, as compared to ETR2 which is based on current tax expenses as well as deferred tax expense. However, the statistical results are robust across most specifications.

Table 8: Pooled OLS Model Regression Results

Model:
$$ETR = \beta0 + \beta1SIZE_t + \beta2LEV_t + \beta3CAPINT_t + \beta4ROA_t + \beta5INVINT_t + \beta6FOROPE_t + \beta7MNC_t + \epsilon_t$$

Variable	ETR1 Coefficient (t-stat)	ETR2 Coefficient (t-stat)
C	18.401 ***[5.523]	16.669 ***[5.503]
SIZE	1.974 ***[3.229]	2.169 ***[3.903]
LEV	-25.279 ***[-6.310]	-20.324 ***[-5.580]
CAPINT	-12.571 ***[-5.933]	-6.459 ***[-3.352]
ROA	-19.702 ***[-2.669]	-16.139 **[-2.405]
INVINT	4.259 [1.266]	-2.643 [-0.864]
FOR	0.014 [0.556]	0 [0.009]
MNC	-2.299 **[-2.291]	-0.865 [-0.948]
Adjusted R-Squared	6.5%	2.9%
F-Statistic (P-value)	15.513 (0.000)	7.227 (0.000)
Firm (Firm-years)	294 (1470)	294 (1470)

Note:
*** Significant at the 1%-level; ** Significant at the 5%-level; and * Significant at the 10%- level. Standard errors are white heteroskedasticity consistent.

Variable definitions are as follows:
ETR1 is measured as current income tax expense divided by income before interest and taxes; ETR2 is measured as total tax expense (current income tax expense plus deferred tax expense) divided by income before interest and taxes; $\beta0$ is the constant; $\beta1SIZE$ is a firm size measured as log of total assets; $\beta2LEV$ is a firm leverage measured as long-term debts divided by total assets; $\beta3CAPINT$ is capital intensity measured as fixed assets divided by total assets; $\beta4ROA$ is return on assets measured as pre-tax income divided by total assets; $\beta5INVINT$ is inventory intensity measured as inventory divided by total assets; $\beta6FOROPE$ is foreign operation measured as foreign sales divided by total sales; $\beta7MNC$ is multinational corporations, dummy variable that is 1 when a firm reports foreign assets and 0 otherwise; ϵ is an Error term; t is the firm-years between 2000 to 2004.

Summary and Conclusions

This study has examined the variability of corporate ETRs for large Malaysian large listed companies in the new tax regime. Seven accounting variables are used to explain the relationship between company characteristics and variations in their ETRs. The explanatory variables are company size, leverage, capital intensity, returns on assets, inventory intensity, foreign operations and multinational company. The analyses are based on a balanced panel sample of 294 (1470 firm-years) of Malaysian public listed companies for the year 2000 to 2004. Fixed and random effects models are used to measure, not only companies observed heterogeneity, but also unobserved companies heterogeneity, such as managers' strategies and tax specific effects that will also affect their ETRs.

The results from this study suggest that the corporate effective tax rates differ considerably between companies from the same sector and between sectors during the period 2000 to 2004. The average ETRs for all sectors fall below the statutory tax rate of 28%, that is, 20.4% for ETR1 and 22.49% for ETR2. The statistical tests confirmed the variations of corporate ETRs within and across sectors. This study also found that companies that paid higher effective taxes are from properties, trading and services and constructions sectors. Nevertheless, the study found that on average the sample companies experienced a stable corporate effective tax rates throughout the investigation periods 2000 to 2004, that is, during the new tax regime.

The empirical results provide a significant and negative relationship between return on assets (ROA) and ETRs. This indicates that highly profitable companies are able to avoid tax through the tax incentives or investment in the tax exempt income activities. The study also found a significant positive relationship between company size and ETRs. Thus, the positive relationship indicates that larger companies face higher income tax burdens. The results from a random effects and pooled OLS models provide additional evidence for leverage and capital intensity. The study found that highly leveraged and highly capital intensive companies face lower ETRs. Additionally, this study found evidence that companies use international operations to reduce their income tax burdens. Further, the statistical results observe that ETR1 measurement which is based on the current tax expense, seems to provide better results in all specifications. Finally, it is important to condition for unobserved company heterogeneity in the specifications.

Thus, the empirical results confirmed that Malaysian corporate tax system provides significant amount of tax incentives to companies. However, the variability in corporate ETRs indicates that the tax incentives only benefit certain companies. Hence, this raises issues of inequity and non-neutrality of the present corporate tax system. Further, the current study provides at least a partial explanation as to the attributes of companies that systematically avoid taxes while other companies pay their fair share of taxes during the year 2000 to 2004. Therefore, the findings from this study can provide important risk assessment tools to tax authorities for tax audit and investigation exercise, and hopefully may be able to assist the government in designing tax laws that would minimize undue tax avoidance.

The use of financial data instead of actual tax data to measure the corporate tax liability, however, limits the results of this study. Since, the findings from this study indicate the existence of aggressive tax planning activities among the sampled companies; therefore, future research should examine tax strategies used by large companies in their tax planning.

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Appendix 1: Tax Incentives Available to the Main Sectors or Economic Activities

No	Type of Incentives	Manufacturing	Trading	Agricultural	Tourism	Education	Communication, Utilities & Transportation	High Technology & Multimedia	Service
1	Pioneer Status	✓		✓	✓			✓	
2	Investment Tax Allowance	✓		✓	✓	✓	✓	✓	✓
3	Special Incentives in the Promoted Areas	✓		✓	✓		✓		✓
4	Export Allowance		✓						
5	Reinvestment Allowance	✓		✓					
6	Infrastructure Allowance								✓
7	Industrial adjustment Allowance								
8	Promotion of Exports	✓	✓	✓		✓			✓
9	Double Deductions: Export, Training, Freight charges, overseas promotion expenses	✓	✓	✓	✓		✓		
10	Research & Development	✓		✓					
11	Exemption of Import Duty, Sales Tax & Excise Duty	✓		✓	✓	✓	✓		✓
12	Exemption of Statutory Income		✓		✓	✓	✓		✓
13	Concessionary Tax Rate		✓						
14	Group Relief of Adjusted Loss			✓					
15	Investment Allowance						✓		✓

Source: 2004 Budget Commentary & Tax Information by MIA, MIT & MICPA