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Introduction of the Single-Tier Corporate Tax System: Its Effect on Share Price

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Abstract: Malaysia and Singapore are the first countries to end their 45-year old imputation tax systems by replacing it with the simpler single-tier corporate tax system. Corporations have ceased to keep records of dividend tax credits required under the imputation laws with the implementation of the single-tier tax system. We find evidence from Malaysia and Singapore on how the share prices responded to the announcements in 2007 and 2002 respectively. The Singapore market reacted positively to the announcement; the Malaysian results were influenced by the global credit crunch. Also, we measured the ex-dividend day average price-drop ratio to test if the predicted tax effect on ex-dividend days moved according to theory. In both countries, the average price drop ratio moved closer to 1.00 as predicted by theory. This is due to the absence of capital gains and zero personal tax under the single tax system. Given the world-wide interest in the single-tier tax regime for future corporate tax reforms, our finding is a first to identify a theory-consistent result on this new topic.

Key words: Event study, ex-dividend day share price, imputation tax, single-tier tax
JEL classification: G14, G32, H2

1. Choice of Policy

Throughout history, taxation has been imposed as a means of financing many functions. Tax has been used to fund the government's operating expenditure, spending on war, public infrastructure, subsidies and welfare for the communities. Tax also serves to function as an economic intervention tool to protect businesses and industries, and also to protect the consumers. It also functions to influence consumer behaviour by discouraging consumption of unhealthy products like cigarettes or dicouraging undesirable activities such as gambling.

Initially, taxation was made very simple. Evidence has been found that the early civilisations in Egypt and China imposed tax based on the economic potential of the given

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establishment which could be grains, gold, silver, cattle, and others.[1] Nevertheless, as time went by, taxation became more comprehensive with the rise of better public facilities and modern civilisations. From a collection of different excises such as window tax, horse tax, and heat tax, taxation was later institutionalised as a system which was applied across different classes of income (Steinmo 2003).

Early modern taxation records show that property tax was the major portion of government total tax income. Nevertheless, Seligman (1890) pointed out that property tax has a weakness in that it discourages agriculture. Furthermore, it lacked uniformity in appraisal and failed to address the actual worth of the land or property concerned. In the US, it was later realised that the portion of income contributed by property tax had declined from about 51 per cent in year 1930 to only 14 per cent in year 1950 (Newcomer 1953).

For some countries, the need to finance war expenditure following failure to collect sufficient taxation income eventually pushed the governments into increasing the income tax rate. In the US, personal income tax for the top marginal bracket was once as high as 94 per cent from year 1942 to 1945. This was the highest since its introduction in 1909,[2] being only 7 per cent previously (US Federal 2011). Despite a high income tax rate historically, recent trends show that income from corporate tax is declining over the years. From the 1950s, corporate tax income was a staggering 30 per cent of the total government income; however, it now accounts for only about 10 per cent (OMB 2013). The situation is similar in Singapore and Malaysia. Singapore's corporate tax rate was at 26 per cent in 1997; however, of late, it is a low 17 per cent. Also, Malaysia recorded a corporate tax rate as high as 40 per cent in the 80s, but in 2010, the tax rate came down to 25 per cent (Zariyawati *et al.* 2010). Other countries, including the Middle-East, have also shown a similar trend which could be due to increased competition, the need to increase foreign investment, and to provide encouragement to local growth and industry (World Databank 2013).

Following the debate on corporate tax was the imposition of tax on the dividend income, which had been taxed at the corporate level. Based on common applied accounting law, corporations and individuals are considered as different entities, with each being liable to taxation. Therefore, based on this argument, dividend income needs to be taxed once it reaches the hands of investors. When corporate income is taxed twice - at the corporate and personal level- it is termed as 'double taxation'.

To get away from this law, the imputation tax system provides a better solution by giving credits to the amount of dividend taxed at the corporate level, and integrating the individual and corporate taxes. The study of Gujarathi and Feldmann (2006) has outlined the classifications of the dividend imputation system as follows: (i) Classical (no imputation), (ii) Mixed (partial imputation), and (iii) Conduit (full imputation). Almost no country at the moment applies the classical double taxation. The US was known to apply double taxation

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[1] Silverman (2002) records evidence from ancient Egypt around 3000BC where tax was obliged as a form of submission to the king and symbol of faith. Tax was remunerated in the form of crops by some percentage of the harvest. Nevertheless, compulsory labour was required from those without the means to pay for the tax.

[2] Modern corporate income tax law was introduced in the year 1909 in the United States under The Corporate Tax Act of 1909. This law was created following the establishment of a 'separate entity' principle of corporations under Revenue Act 1894. Current corporate income tax laws take root from these laws, despite the amended definition of income over time (Taylor 2002).

in the past before the major dividend tax cut took place during the Bush administration starting in 2003. Due to undesirable features of the double taxation system, more countries have now made an effort to move to the implementation of the imputation tax system. Nonetheless, these countries have adopted their own version of the imputation tax system. One variant applies the dividend-franking system, as implemented in Australia. The franked dividend offsets the dividend income tax at the individual level by the amount of franked credits for tax. Another variant of the imputation tax is the split-rate tax system, where a lower than corporate tax rate is applied for the dividend income. Therefore, the tax burden is reduced for the investors. This type of variant is currently applied in Belgium, Denmark, Italy and Austria.

The next stage of corporate-individual tax integration is the full imputation tax system, or currently referred to as the single-tier corporate tax system which has now been pioneered by Singapore and Malaysia. Singapore adopted the new system in 2003, whereas Malaysia followed up in year 2008. This single-tier system has finally abolished all dividend income taxation,with corporate income tax being final at the corporate level. Besides leaving the investors with more cash, the single-tier tax is claimed to be more practical and cost effective. More countries have expressed the intention to adopt and implement this system but are facing some issues and conflict of interest.

Also, given the collection of a lower corporate tax income, it is observed that the indirect tax of Goods and Services Tax (GST) or Value Added Tax(VAT) has been widely introduced. Although the tax was known to be introduced in France back in the 1950s, it has now been implemented in 127 countries, with rates as high as 25 per cent (Mohd Aswadi 2012). This consumption tax has a costly effect on the consumer as the consumer has to pay tax for the goods and services received. This tax is criticised on the grounds that it would not discriminate the level of income of the end consumer. It is therefore termed as regressive tax as the lower income group will have to pay a greater percentage of their income. Furthermore, the practice could potentially increase the price of the products and services, especially when the manufacturers could possibly pass the cost to the end consumer. One suggestion is to exempt the basic and necessity items from GST so as to assist the lower income group from the escalating cost of living.

While the debate on the best tax policy solution continues, it is best to exemplify some governments that have successfully implemented the system. This paper investigates an alternative to the corporate-individual integration of dividend taxation. An example of the transition of two countries, Malaysia and Singapore, from an imputation tax system to full imputation tax system that is fully dividend tax-free is presented and the impact it has on firms' share value is discussed.

2. History of Taxation in Malaysia and Singapore

Being strategically well positioned along land and sea trade, Malaysia and Singapore share a long history of foreign occupation from the 1500s. The history of modern income tax, however, has been recorded from the later part of British occupation in the 1800s. Under British occupationn, Income Tax Ordinance 1947 was introduced, which was modeled on the British Tax Ordinance 1922. Hence, Singapore and Malaysia share similar historical roots of law with other Commonwealth member countries such as Australia, New Zealand, Canada, India and several others.

In spite of Malaysia and Singapore achieving full independence in 1957, the tax system is heavily influenced by British laws. This includes laws in regard to business and trade. Therefore, it is seen that Malaysia and Singapore continue to adopt a similar imputation tax system, as previously applied, under the Income Tax (amendment) Ordinance 1958. With this tax, dividend income was taxed as stated in the individual marginal tax bracket. Table 1 summarises the historical individual and corporate tax rates for both Malaysia and Singapore. In year 1965, Singapore was separated from Malaysia due to political reasons, and reinstated the income tax law in accordance with the country's new ruling the following year. Similarly, in Malaysia, the Income Tax Act 1967 reinstated the previous income tax law.

The imputation tax system has been in place in both Malaysia and Singapore for more than half a century. It is therefore not surprising that more efforts have been made to improve the system and completely abolish the dividend income taxation and replace it with the new single-tier tax system. In 2002, under Income Tax (Amendment) Act 2002, the

Table 1. Malaysia and Singapore: Top statutory marginal tax rates

Panel A: Individual income tax rate (Single taxpayer)			
Malaysia		Singapore	
Year	Tax Rate (%)	Year	Tax rate (%)
2010-2013	26	2012-2013	20
2009	27	2006-2011	20
2003-2008	28	2005	21
2002	28	2003-2004	22
2000-2001	29	2002	26
1996-1999	30	1997-2001	28
1995	32	1994-1996	30
1993-1994	34	1987-1993	33
1991-1992	35	1986	40
1985-1990	40		
1980-1984	55		
Panel B: Corporate tax rate			
Malaysia		Singapore	
Year	Tax rate (%)	Year	Tax rate (%)
2009-2013	25	2010-2013	17
2008	26	2008-2009	18
2007	27	2005-2007	20
2002-2006	28	2003-2004	22
2000-2001	29	2002	24.5
1995-1999	30	2001	25.5
1994	32	1997-2000	26
1993	34	1994-1996	27
1989-1992	35	1993	30
1988	40	1991	31
		1990	32
		1987	33
		1959-1986	40

Singapore parliament passed the single-tier tax law which took effect from 1 January 2003. A transition period of 5 years was given for the firms to adopt and use up the remaining credits provided by the corporate income tax. By year 2008, the new single tier tax had been fully implemented. Following Singapore, Malaysia also adopted the new system in year 2008 with a transition period of 6 years. Under the amendment of the new Finance Act 2007, Malaysia has recently fully implemented the new tax system effective year 2014. Along with the cessation of dividend taxation, both the governments of Malaysia and Singapore have gradually reduced the corporate tax rate, providing one of the most competitive tax rates across the region to attract foreign direct investment.

3. Literature Review

Influential studies in accounting and finance have laid out theories that explain tax law effects on share value. Indeed, early modern theory of valuation proposes that in a perfect economy where there is no tax of any kind, there is no advantage for firms or shareholders to gain from acquiring either debt or equity (Modigliani and Miller 1958; 1963). Further extending the tax framework to the dividend policy, Miller and Modigliani (1961) propose that in an ideal or perfect market, dividend is also not relevant for firm value. This is because the redistribution of value of income as dividends would lead to loss of value of the firm as dividends are paid out on ex dates by firms. Firm value can only be increased through other sources such as investment increasing earnings, but not from simply repackaging the earnings as dividends or as retained earnings. They further emphasise that the change in share pricewhen dividend increases is due to signaling of dividend increase permanently, and such a change in share value is not due to dividends *per se* but due to the earnings having increased to sustain the dividend increase. Therefore, incorporating the value of a tax shield and that of the value of a permanent increase in dividends, the value of the levered firm can be expressed as:

$$V_L = V_U + \tau_c D \quad (1)$$

where the change in dividend cash flow, ΔDIV is argued to be due to signalling effect.

In other words, dividend announcement is assumed to have some information about future increased earnings of the firm. They argue that this is not a dividend *per se* effect. An empirical test was conducted (Miller and Modigliani 1966) with a sample of firms that had similar characteristics. Their analysis with the dividend yield variable showed insignificant tax effect, providing support for their dividend irrelevancy theory. Nevertheless, an early study of Lintner (1956) found that firms are likely to adopt long-term target dividend ratio. The payout ratio is likely to sustain given the short-term changes in the dividend ratio consistent with the target, and also consistent with the earnings of the firm over time. Furthermore, cash dividend signals information about management's current assessment of future earnings. It is also suggested that the probability of change in dividend policy depends both on the direction of past earning changes as well as the recency of these changes in earnings (Fama and Babiak 1968).

A similar study was conducted using NYSE data for the period 1968 to 1973 (Griffin 1976). He included in his model the variables of earnings, dividends, and analysts' forecast of earnings. He reported evidence of the significant joint effect of dividends in announcement months, indicating the presence of unique information, especially in the decline in dividends.

This joint effect was further investigated by Brown *et al.* (1977). Based on the earnings report and dividend payments from the Melbourne Stock Exchange (MSE), they found the variables to "have an immediate impact" on share prices. Also, evidence of interaction of information effects is found in the correlation of dividend and changes in profit.

Later researchers adopted several methods to investigate this information effect of dividends. Some have looked into abnormal trading volume around the announcement dates (see Asquith and Mullins 1983; Asquith and Krasker 1985; Richardson *et al*. 1986). There is also a study that looked into insider trading before the announcement (John and Lang 1991). Nevertheless, strong evidence of information in dividend increases is found by Nissim and Ziv (2001). They found that dividend changes (increases) are positively related to the unexpected positive earnings of the following two years. This finding is indeed in contrast to the past theoretical argument that predicts that dividends would decrease the value of a firm.

Other than focusing on the information content of the dividends, there are studies that investigated the dividend *per se* effect such as the study of Brennan (1970).[3] By incorporating the impact of personal taxation, Brennan developed an after tax capital asset pricing model (CAPM), which could be specified as

$$E(\mathrm{R}_j) - r_f = b\beta_j + \tau(\mathrm{d}_j - \mathrm{r}_f) \quad (2)$$

where $E(R_j)$ and r_f are before tax expected return and return on risk-free asset for security j, respectively. Variable β_j is beta, the systematic risk and variable d_j is the dividend payout on each security j. The estimated parameter τ of the dividend yield variable would signify the tax premium per unit of dividend yield, or the relevance of dividend payment to the value of a firm.

This theory has been tested in several studies, similar to or with changes to the initial model. Examples include Litzenberger and Ramaswamy (1979; 1980; 1982), Ariff (1985), Poterba and Summers (1984) and Gentry *et al.* (2003). Some of the empirical works report that the dividend term is highly significant, although there have been some arguments about the significance of the results (see Chen *et al*. 1990).

Another tax-related model is by Elton and Gruber (1970) which supports Brennan's view that differential tax between dividend and capital gains tax could have an impact on the value of a firm. Looking at the ex-dividend day share prices, they developed an expression for the relationship between the dividend payment of a firm and share prices, which could be shown to be:

$$\frac{P_B - P_A}{Div} = \frac{1-\tau_p}{1-\tau_{cg}} \quad (3)$$

where, P_B is the stock price before the ex-dividend day P_B and after P_A provides the price reaction around the ex-dates of dividends. If this difference is exactly equal to the amount of dividends in the denominator, then the trade of a share is with no regard to the tax effect of dividends. But traders trade on the basis of ex-dividend 'after tax'. Therefore, in a

[3] Brennan's (1970) work is an extension of the framework constructed by Farrar and Selwyn (1967) using the market equilibrium modeling approach by extending the CAPM model to taxation. Rubinstein (1973) found that the CAPM model is consistent with the Modigliani-Miller perfect capital market theory prior to incorporating tax effect.

situation where dividend tax is higher than capital gains tax ($\tau_p > \tau_{cg}$), the price drop ratio is expected to be less than 1.00, on average as shown in their study.

Nevertheless, if the capital gains tax is higher than the dividend tax rate, it is expected that the average price drop ratio would be higher than 1.00. In the case of single tax regime, capital gains tax and personal tax rates are zero in Malaysia as well as Singapore, so the ratio should be equal to 1.00 when all firms have fully adapted to the new law following the 5-year transition period.

Example :

(a) During imputation tax system, $\tau_p > \tau_{cg}$ where τ_p =0.25 and τ_{cg} =0

Therefore, implied average price drop ratio $= \frac{1-\tau_p}{1-\tau_{cg}} = \frac{1-0.25}{1} = 0.75$

(b) Post imputation tax system, $\tau_p = \tau_{cg}$ where τ_p =0 and τ_{cg} =0

Therefore, implied average price drop ratio $= \frac{1-\tau_p}{1-\tau_{cg}} = \frac{1-0}{1-0} = 1$

To support their theoretical framework, Elton and Gruber (1970) observed the ex-dividend day share price drop ratio on the NYSE stocks during 1966 to 1967 period. The average share price declined as a percentage of dividends paid and was reported to be 77.76 per cent. That is, the average tax impact in the US revealed that the implied marginal tax bracket of investors was 36.4 per cent during the period tested. They also discovered the clientele effect (till then a speculation of Miller and Modigliani in their 1966 paper) indicating that firms with low dividend yield have high implied marginal tax rate, while firms with high dividend yield have low implied marginal tax rate. In other words, the investors are very likely to reposition themselves to maximise their profit, therefore choosing investment portfolios according to their marginal tax bracket.

This model has been replicated by many in several countries with different extended methodologies. So far, most of the studies show evidence of a share price drop ratio of less than 1.00, on average when there is taxation difference between capital gains and personal tax.[4] Despite such concrete results, there are studies questioning the interpretation by Elton and Gruber (1970). The question posed was, ' is it due to arbitrage (Kalay, 1982; Lakonishok and Vermaelen, 1983; 1986), transaction costs (Eades *et al.* 1984; Karpoff and Walkling, 1988; 1990), or to market microstructure' (Bali and Hite, 1998; Frank and Jagannathan, 1998)?

Nevertheless, these arguments fail to fully explain repeated evidence where the ratio could be higher than 1.00, which is indicated when a country has $\tau_p > \tau_{cg}$. In a recent paper, Elton *et al.* (2005) provide evidence of a price drop ratio of more than one in a sample where dividend tax rate is lower than the capital gains tax rate. They observed a sample of closed-end mutual funds that contained a set of securities where tax would cause the fund price to fall more than the dividends. Clearly, the tax argument is inconsistent with other interpretations, especially the market microstructure which is likely causing the results.

Our study on Malaysia and Singapore is unique since these are the first countries to be tested for tax effect of dividend tax laws. While the previous tax effect studies indicate different results, it is of interest to see whether the impact of a single tax would be capitalised

[4] See Blume *et al*. (1974), Pettit (1977), Lewellen *et al.* (1978), Elton *et al.* (1984), Barclay (1987), Green and Rydqvist (1999), Gagnon and Suret (1991), McDonald (2001), Bell and Jenkinson (2002) and Graham *et al*. (2003).

as increased firm value when capital gains tax move towards equity with personal tax. Also it would be interesting to see if the ex-dividend price completely discounts the amount of dividend paid per share. Our study which applied two separate theories to examine the unique case would be a modest contribution to the debate on taxation theory.

4. Data and Methodology

4.1 Identification of Events

Events were identified using the country's mainstream media, mainly the newspaper archives. Also, the Factiva newspaper database was referred for relevant event dates pertaining to changes in tax. These dates were verified with the official government websites where event dates were kept in a database. As the budget discussion meetings were held months before the official presentation, the choice of dates could be subjective. Therefore, we only selected those dates where officials from the government had made a statement ensuring greater certainty of a resolution of the discussion.

In early April 2002, Prime Minister Lee Hsien Loong made a general statement about the tax cut to the press for the next budget proposal. The details of the tax cut were unveiled on 11 April 2002 when the chairman of the sub-committee on tax, Tharman Shanmugaratnam, made a press statement about the single-tier corporate tax being proposed in the Budget. The budget was formally presented on 3 May 2003. The bill was finally approved on 23 May and enacted as law. As for the Singapore events, the important ones are summarised in Table 2.

In the case of Malaysia, hints to indicate the elimination of dividend taxation were rather limited. Most of the news focused on the new corporate tax cut, which had already been announced in the previous budget year. In many press conferences, the officials only gave a summary of the whole budget, and talked about how it would benefit the public and corporations through incentives. Four events which pronounced the details of changes in the previous imputation tax system have been identified and summarised in Table 3.

On 29 May 2007, Prime Minister Abdullah Ahmad Badawi mentioned in a press conference about the general proposals of Budget 2008. Nearer to the presentation date, on 5 September 2007 the President of the Malaysian Institute of Taxation (MIT), Dr Veerinderjeet Singh revealed the inclusion of single-tier tax proposal in the budget. The budget was presented two days later on 7 September 2007, detailing the government plan to impose a

Table 2. Singapore: Implementation of single-tier tax

Event dates	Description of event
4 April 2002	A speech was made by PM Lee Hsien Loong in Parliament about general tax cut.
11 April 2002	Revelation of single tier tax system in the Budget 2003 proposal by the Economic Review Committee (ERC) member.
3 May 2002	Presentation of Budget 2003 to Parliament
23 May 2002	Enactment of Bill as law

Source: The event dates were identified from selected news from the mainstream media and government websites regarding the 2002-2003 Budget.

Table 3. Malaysia: Implementation of a single-tier tax

Event dates	Description of event
29 May 2007	General announcement of budget 2008 hearing date.
5 September 2007	Revelation of single-tier corporate tax proposal
7 September 2007	Presentation of the budget by Prime Minister at Dewan Rakyat
3 December 2007	Endorsement of budget by Parliament

Source: Relevant and important event dates were chosen from selected news from the mainstream media and government websites on the 2008 budget.

single-tier tax. The proposal was endorsed later on 3 December 2007 after further consideration by the Senate. The law took effect on 1 January 2008. However, taking into consideration the 6-year transition period, it would not be until the end of year 2012 before full implementation is carried out, most likely starting in 2013.

4.2 Data and Variables

In addition to the identification of events, relevant variables such as the firm's and market's adjusted share prices, and dividend yield were collected from DataStream. Also, for the purpose of the ex-dividend date share price behaviour study, dividend amounts and ex-dividend dates were also collected from the same database.

4.3 Method

For the announcement effect, we used the widely known event study method by MacKinlay (1997), where abnormal returns, AR_i are calculated from the difference of real return R_i and expected returns ER_i:

$$AR_i = R_i - ER_i \tag{4}$$

Expected return is measured using the Brown and Warner (1985) method of market adjusted return. The expected return is measured as:

$$AR_i = R_i - R_m \tag{5}$$

where R_m is the market index adjusted price. The abnormal return, AR_i was then accumulated from each firm and averaged out, which can be referred to as AAR_t, and calculated across all firms in a cross-section of time from $i = 1, N$ firms.

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} A_{it} \tag{6}$$

Then we applied the Brown and Warner (1985) *t*-statistic test, which can be done cross-sectionally across all firms, and also vertically across the event windows. The equation below shows how it is done across firms, where average abnormal return is divided by its standard error:

$$t = AAR_t / S(AAR_t) \tag{7}$$

The calculation of standard error, $S(AAR_t)$, of estimated abnormal returns is as follows:

$$S(AAR_t) = \sqrt{\left(\sum_{t=-240}^{t=-61} (AAR_t - A^*)^2 \div \right) / 179} \tag{8}$$

where A* is the means of estimated abnormal returns, which is:

$$A^* = \frac{1}{N}\left(\sum_{t=-244}^{t=-61}(AAR_t)\right) \quad (9)$$

As the initial results provide some indication of heteroskedasticity, the standardised *t*-statistic is applied for the calculation of average abnormal returns as described in Boehmer *et al.* (1991):

$$Standardised\ t-stat = \frac{1}{\sqrt{N}}\sum_{i=1}^{N}\frac{A_{i,t}}{\hat{S}(A_i)} \quad (10)$$

where

$$\hat{S}(A_i) = \sqrt{\frac{1}{T_i}\sum_{-244}^{-6}(A_{i,t}-\bar{A}_t)^2} \quad (11)$$

and

$$\bar{A}_t = \frac{1}{T_i}\sum_{-244}^{-6}A_{i,t} \quad (12)$$

To test the significance of abnormal returns across event windows, the average abnormal returns are first accumulated across the period test window, from day K to L:

$$CAR_{(K,L)} = \sum_{t=K}^{L}\mathrm{AAR_t} \quad (13)$$

Then the t-value of the cumulative abnormal returns is calculated where $CAR_{(K,L)}$ is divided to its standard error, $S(CAR_{(K,L)})$:

$$t = CARS_{(K,L)} / \mathrm{S}(CAR_{(K,L)}) \quad (14)$$

where $S(CAR_{(K,L)})$ could be calculated by taking the root of mutiplication of the number of days, *T* to the variance of the abnormal returns:

$$S(CAR_{(K,L)}) = \sqrt{T\ \mathrm{var}(AAR_t)} \quad (15)$$

5. Results

5.1 Announcement Effect

5.1.1 The Singapore Case

Initial observations on the Singapore main market index were examined to view any significant movement around main event dates. Aware that the index might provide confounding effect from many events, more tests were done subsequently to confirm the results. The first indication of a single-tier tax was revealed in a press conference on 11 April 2002, when the index returns surged by 1.46 per cent (see Appendix A, Table A1 and Figure A1). A mild increase in index return of 0.38 per cent was observed on the day the budget was presented to Parliament on 3 May 2002. Nevertheless, the market index return declined to -1.14 per cent, with the index price falling from 1738 to 1718 when the Budget was approved on 23 May 2002.

Average abnormal returns (AR) across all available firms were then calculated around the event dates. Nevertheless, only one significant AR was found with abnormal returns of about 2 per cent being recorded on day 3 after the press conference on 11 April 2002. The ARs of each event date are summarised in Table 4.

Looking at the cumulative abnormal returns, it is found that there is a significant delayed impact upon revelation of a single-tier tax plan to the public on 11 April 2002 (Table 5). The AR recorded -0.29 per cent; however, after day +2, CAR accumulated to 4.6 per cent over four days. Highly positive but less significant CARs of 1.1 per cent and 2.0 per cent

Table 4. Average abnormal returns(ARs), whole portfolio in Singapore

Daily abnormal returns are calculated based on the market adjusted model. Standardised *t*-statistic is used to measure the significance; the *p*-value is denoted with asterisk *(0.1), **(0.005) and ***(0.001). The ARs are in percentages.

	4/4/2002 General tax cut announced		11/4/2002 Single-tier tax revealed		3/5/2002 Budget presentation		23/5/2002 New law approved	
Day	AR	*t*-Stat	AR	*t*-Stat	AR	*t*-Stat	AR	*t*-Stat
+5			1.60	(1.55)	0.34	(0.33)	0.61	(0.57)
+4	0.86	(0.83)	0.23	(0.22)	-0.43	(-0.42)	-0.15	(-0.14)
+3	0.45	(0.43)	1.97	(1.91)**	-0.72	(-0.70)	-0.24	(-0.22)
+2	-0.03	(-0.03)	-0.52	(-0.50)	0.52	(0.50)	0.00	(0.00)
+1	0.96	(0.92)	-0.51	(-0.50)	1.09	(1.05)	-0.64	(-0.61)
0	**0.18**	**(0.17)**	**-0.29**	**(-0.28)**	**-0.75**	**(-0.73)**	**0.84**	**(0.80)**
-1	-0.19	(-0.18)			1.62	(1.55)	-0.17	(-0.16)
-2	-1.82	(-1.72)*			-0.01	(-0.01)	-0.42	(-0.41)
-3	-0.49	(-0.46)			0.33	(0.32)	0.29	(0.28)
-4	0.00	(0.00)			-0.30	(-0.29)	0.39	(0.38)
-5	-0.68	(-0.64)			-0.43	(-0.41)	0.34	(0.33)

Table 5. Cumulative average abnormal returns, whole portfolio in Singapore

Short-term cumulative abnormal return (CAR) of -1 to 0, 0 to +1 and -1 to +1 are calculated for the event dates. CAR 1 is given in percentages. Number of available firms range from 351 to 357. Significant *t*-tests are denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05) and *** (0.01).

Event date	-1 to 0	0 to +1	-1 to +1	Others	
04/04/2002	-0.009	1.141	0.956		
General tax cut announced	(-0.006)	(0.782)	(0.523)		
11/04/2002	0.563	-0.800	0.049	4.577	+2 to +6
Single-tier-tax revealed	(0.386)	-(0.549)	(0.027)	(2.207)**	
03/05/2002	0.874	0.338	1.962		
Budget presentation	(0.598)	(0.231)	(1.096)		
23/05/2002	0.665	0.198	0.028		
New law approved	(0.453)	(0.134)	(0.015)		

were seen during revelation of the information on 4 April and 3 May 2002 where the budget was presented to parliament. Short term CARs of -1 to 0, 0 to +1, and -1 to +1 are summarised in Table 5. Additional CARs of different event windows are indicated in the last column of the table.

We further investigated the impact by filtering out the non-dividend paying firms from the sample. From the dividend-paying sample, two portfolios were constructed; based on dividend yield the firms were sorted into high and low dividend yielding portfolios. Calculation of ARs are summarised in Table 6. It is evident that there are significantly positive ARs for both portfolios after the revelation of the tax cut was made on 4 April 2002.

Table 6. Singapore: ARs of high-to-low dividend yielding portfolios (%)
Average abnormal returns (AR) are calculated around each of the event dates. The ARs are given in percentages. Number of available firms range from 351 to 357. Significant *t*-tests are denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

Top 50% dividend yield portfolios								
	4/4/2002 General tax cut announced		11/4/2002 Single-tier tax revealed		3/5/2002 Budget presentation		23/5/2002 New law approved	
Day	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test
+5			1.70	(5.88)***	0.56	(1.66)*	-0.23	(0.22)
+4	1.35	(5.44)***	-0.04	(-0.08)	0.05	(0.17)	0.90	(2.44)**
+3	0.47	(1.814)*	-0.26	(-0.83)	-0.77	(-3.31)***	-0.11	(0.47)
+2	0.17	(1.12)	0.25	(0.52)	0.27	(1.19)	0.00	(0.00)
+1	0.77	(2.27)**	-0.81	(-2.57)**	1.03	(3.89)***	-0.12	(-0.71)
0	**0.50**	**(1.60)**	**-0.50**	**(-1.73)***	**-0.23**	**(-0.81)**	**1.03**	**(3.46)*****
-1	0.13	(1.11)			0.74	(1.51)	-0.67	(-2.25)**
-2	-0.20	(-0.25)			0.00	(0.00)	-0.27	(-0.43)
-3	0.16	(0.84)			-0.12	(-0.40)	0.50	(1.81)*
-4	0.00	(0.00)			-0.19	(0.16)	0.44	(1.67)*
-5	-0.08	(-0.99)			-0.52	(-1.63)	0.63	(1.39)
Bottom 50% dividend yield portfolio								
	4/4/2002 General tax cut announced		11/4/2002 Single-tier tax revealed		3/5/2002 Budget presentation		23/5/2002 New law approved	
Day	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test
+5			1.30	(3.71)***	-0.10	(-0.25)	0.91	(1.94)**
+4	0.45	(2.10)**	0.00	(-0.39)	-0.32	(-0.81)	-0.29	(-0.55)
+3	0.63	(1.84)*	5.30	(31.7)***	-0.33	(-1.35)	-0.13	(-0.63)
+2	0.28	(0.54)	-0.66	(-1.96)**	0.19	(1.03)	0.00	(0.00)
+1	0.24	(0.74)	-0.43	(-1.28)	0.99	(2.46)**	-0.95	(-2.30)**
0	**0.24**	**(0.53)**	**-0.51**	**(-1.79)***	**-0.41**	**(-0.52)**	**0.95**	**(2.37)****
-1	0.02	(0.21)			1.05	(1.82)*	-0.52	(-1.61)
-2	-5.26	(-31.5)***			0.00	(0.00)	-0.42	(-1.86)*
-3	-0.32	(-0.51)			-0.07	(-0.16)	0.24	(0.74)
-4	0.00	(0.00)			-0.31	(-0.75)	0.05	(0.31)
-5	-0.70	(-2.02)**			-0.51	(-1.10)	0.60	(1.16)

Both portfolios showed slightly significant negative reaction during the initial release of information on 11 April 2002. Nevertheless, both portfolios show significantly positive reaction the day after the formal presentation of the Budget on 3rd May 2002. Surprisingly significant mixed reactions were found in between the dates indicating uncertainty of the news status, that is whether good or bad. The reaction was positive upon the enactment of the law on 23 May 2002 with high and low dividend yield recording ARs of 1.03 per cent and 0.95 per cent, respectively, both significant at a *p*-value of 0.05.

Subsequently the CARs of the event dates were calculated and charted to provide a clearer indication (see Table 7 and Figure 1). It can be observed that a significant effect emerged after a few days following an event date. During the official presentation of the Budget on 3 May 2002, both the portfolios signified high positive CARs of about 1.8 per cent each. High dividend portfolios recorded a significant CAR of 1.80 per cent, whereas the low dividend recorded a CAR of 1.82 per cent. Upon confirmation of the budget, the higher dividend yield portfolios recorded a CAR of 2.8 per cent over 6 days.

Figure 1 illustrates the difference between higher and lower dividend yield portfolios. As expected, the lower dividend yield portfolios indicate a more positive reaction towards the single-tier tax announcement on 11 April 2002, recording a significant CAR of 5.5 per cent. This implies the clientele effect where a higher marginal tax bracket group would prefer the lower dividend yield equities due to lower tax. Following the implementation of the new system, the higher marginal taxpayers group would no longer need to pay the tax gap between their personal tax rate and the corporate tax rate. The final confirmation of the law on 23 May 2002 evidenced a more obvious CAR pattern between the high and lower

Table 7. Singapore: CARs of high-to-low dividend yielding portfolios (%)

		-1 to 0	0 to +1	-1 to +1	Others	
04/04/2002	Top 50%	0.628	1.272	1.40	3.269	0 to +4
General tax cut announced		(0.833)	(0.815)	(1.729)*	(2.72)***	
	Low 50%	0.258	0.474	0.495	1.835	
		(0.171)	(0.281)	(0.795)	(0.709)	
11/04/2002	Top 50%	0.849	-1.317	0.035	0.834	+1 to +5
Single-tier-tax revealed		(0.20)	(-1.86)*	(0.020)	(0.384)	
	Low 50%	1.059	-0.817	0.201	5.513	
		(1.083)	(-0.910)	(0.124)	(2.122)**	
03/05/2002	Top 50%	0.508	0.798	1.533	1.804	-2 to +2
Budget presentation		(0.368)	(0.578)	(1.84)*	(1.82)*	
	Low 50%	0.637	0.583	1.629	1.818	
		(0.428)	(0.357)	(1.086)	(1.296)	
23/05/2002	Top 50%	0.358	0.910	0.237	2.757	+0 to +6
New law approved		(0.248)	(0.717)	(0.162)	(1.83)*	
	Low 50%	0.431	0.001	-0.516	0.882	
		(0.736)	(0.060)	(-0.024)	(-1.055)	

Note: The sample consisted of a total of 211 firms after excluding firms which reported no dividend or zero dividends. Significant *t*-test is denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

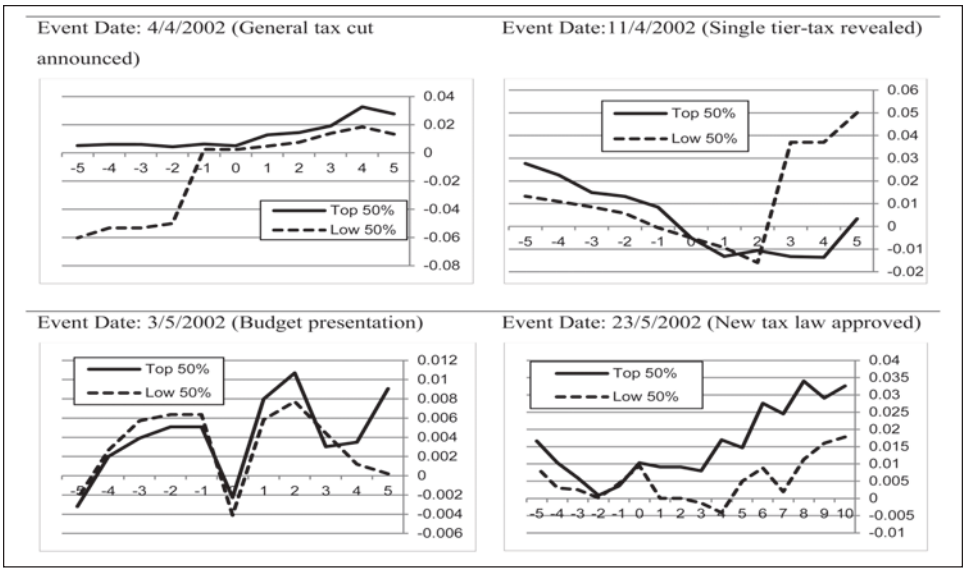

Figure 1. Singapore: CAR of high-to-low dividend yielding portfolios

Note: The figure illustrates the CAR charting of -5 to +5 around four event dates related to the implementation of the single-tier tax system. The difference between high and low dividend yield portfolios is shown by the line trend that accumulated from day 0.

dividend yielding portfolios. High dividend yield portfolios showed a positive trending CAR of 2.65 per cent over 6 days whereas the lower dividend yielding portfolios showed a negative trending CAR of about 2 per cent over 13 days.

5.1.2 The Malaysia Case

Malaysia's budget plan had been discussed since early 2007. Though the corporate tax cut had been discussed earlier, it was brought up again later on 29 May 2007 when government officials informed the date of the Budget presentation. Nonetheless, the news about the single-tier corporate tax plan came as a surprise two days before the official presentation of the budget on 5 September 2007. On that day, the market index return surged by 1.10 per cent, with the price index increasing from 1283 to 1298 (see Appendix A, Table A2 and Figure A2).

During the official presentation of the budget on 7 September 2007, the market index recorded a return of 0.46 per cent, another increase from 1299 to 1305. The market index surged again on 3 December 2007 when the budget was approved by Parliament and recorded a material return of 1.59 per cent. However, it is not possible to make a reliable inference from the market index due to the presence of unrelated confounding effects.

These results indicated the need for further robust analysis. Based on individual firm's data, average abnormal return was calculated around event dates. Significant negative abnormal returns were observed after the formal presentation of the budget on 7 September 2007, which might indicate the loss of tax credit to those in the lower marginal tax bracket as cash tax refunds. The results are found in Table 8.

Table 8. Malaysia: Average abnormal returns, whole portfolios
Daily abnormal returns are calculated based on the market adjusted model. Total number of observations, N, is about 755. Standardised *t*-statistic is used to measure the significance; the *p*-value is denoted by asterisk *(0.1), **(0.005) and ***(0.001). All ARs are in expressed in percentages.

	29/5/2007 (General tax cut announced)		5/9/2007 (Single-tier tax revealed)		7/9/2007 (Budget presentation)		3/12/2007 (Tax law approved)	
Day	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test	AR	*t*-Test
5	0.83	(4.15)***			0.25	(2.41)**	-0.90	(-6.68)***
4	-0.02	(-0.62)			-0.14	(-0.23)	1.71	(15.73)***
3	0.15	(1.17)			-1.10	(-8.58)***	-2.15	(-18.95)***
2	0.22	(0.41)			-0.83	(-7.36)***	0.26	(0.72)
1	-0.65	(-3.61)***	0.35	(1.63)	-0.44	(-3.15)***	0.10	(-0.44)
0	**-0.10**	**(-0.57)**	**0.24**	**(0.83)**	**-1.24**	**(-10.29)*** **	**-0.23**	**(-1.46)**
-1	0.56	(5.81)***	-0.17	(-1.73)*	0.35	(1.63)	0.11	(2.42)***
-2	-0.52	(-7.02)***	1.11	(8.52)***			0.30	(1.49)
-3	-0.36	(-1.24)	0.00	(0.00)			-1.20	(-8.10)***
-4	-0.28	(-1.13)	-0.46	(-4.91)***			-0.29	(-1.96)**
-5	0.66	(5.75)***	-0.26	(-1.06)			-0.78	(-5.73)***

Table 9. Malaysia: Cumulative average abnormal return, whole portfolios
The table summarises CARs of actively trading firms in Malaysia around related event dates; statement from officials (29 May and 5 September 2007), formal budget announcement (7 September 2007), and passing of the budget (3 December 2007).

Event dates	-1 to +0	0 to +1	-1 to +1	Others	
29/05/2007	0.419	-0.706	-0.206	5.021	+2 to +9
(General tax cut announced)	(0.433)	(-0.730)	(-0.174)	(2.598)***	
05/09/2007	0.121	0.507	0.371		
(Single-tier tax revealed)	(0.133)	(0.559)	(0.334)		
07/09/2007	-0.942	-1.712	-1.462		
(Budget presentation)	(-1.032)	(-1.862)*	(-1.307)		
03/12/2007	-0.156	-0.206	-0.084		
(New tax law approved)	(-0.213)	(-0.281)	(-1.096)		

Note: Values are presented in percentages. Total number of observations, N, is about 755; significant *t*-test is denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

The cumulative abnormal returns from available individual firms and series of *t*-statistic test were calculated to indicate the level of significance. All the results are summarised in Table 9. It can be seen that the first revelation of the news about a single-tier tax on 5 September 2007 recorded a positive CAR of 0.5 per cent. Negative CARs of -1.71 *(p*-value < 0.1) and -1.46 (*p*-value > 0.1) were recorded around the official announcement on 7 September

2007 and 3 December 2007, respectively when the law was approved. This might be due to the mixed reaction of the investors (news would only benefit the higher marginal tax bracket but would be a loss for the lower marginal tax bracket investors). Also, the mild reaction might be partly due to the global credit crunch.

In order to observe the impact of this news on dividend paying firms, firms were sorted and separated according to the level of dividend yield into two portfolios - high and low dividend yield. Table 10 shows the daily abnormal returns around the event dates. It appears that both high and low dividend yield portfolios indicated mixed signs a few days before and after the announcement date.

Table 10. Malaysia: Average ARs of high and low dividend yield portfolios

Average abnormal returns (AR) are calculated around each of the event dates. The ARs are in percentages. Number of firms was 517 after excluding zero dividend firms or firms that do not report dividends. Significant *t*-test is denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

	High dividend yield							
	29/5/2007 (General tax cut announced)		5/9/2007 (Single-tier tax revealed)		7/9/2007 (Budget presentation)		3/12/2007 (Tax law approved)	
	AR	*t*-test	AR	*t*-test	AR	*t*-test	AR	*t*-test
+5	0.30	(0.31)	-0.81	(-6.76)***	-0.10	(-0.21)	-0.65	(-5.90)***
+4	-0.22	(-1.21)	-0.51	(-5.57)***	0.12	(0.26)	1.79	(16.07)***
+3	0.06	(-0.11)	-0.45	(-1.70)*	-0.81	(-1.69)*	-1.99	(-18.85)***
+2	-0.05	(-1.11)	-1.08	(-9.42)***	-0.51	(-1.05)	-0.10	(-1.34)
+1	-0.32	(-1.24)	0.36	(2.00)**	-0.45	(-0.94)	-0.19	(-1.93)*
0	**-0.10**	**(-0.38)**	**-0.15**	**(-2.01)****	**-1.08**	**(-2.24)****	**-0.13**	**(-0.62)**
-1	0.45	(3.80)***	-0.18	(-2.09)**	0.36	(0.75)	0.25	(2.22)**
-2	-0.68	(-6.78)***	0.91	(7.83)***	-0.15	(-0.30)	0.14	(1.14)
-3	0.08	(1.26)	0.00	(0.00)	-0.18	(-0.38)	-0.51	(-4.39)***
-4	0.01	(0.46)	-0.79	(-7.84)***	0.91	(1.88)*	-0.19	(-1.02)
-5	0.27	(2.91)***	-0.09	(0.14)	0.00	(0.00)	-0.65	(-5.97)***
	Low dividend yield							
	29/5/2007		5/9/2007		7/9/2007		3/12/2007	
	AR	*t*-test	AR	*t*-test	AR	*t*-test	AR	*t*-test
+5	0.63	(2.23)**	-1.21	(-6.22)***	0.33	(1.97)**	-0.83	(-4.05)***
+4	0.29	(0.62)	-0.65	(-4.32)***	0.03	(0.84)	1.73	(10.59)***
+3	0.31	(1.77)*	-0.71	(-4.05)***	-1.21	(-6.22)***	-2.13	(-12.53)***
+2	-0.08	(-0.99)	-1.00	(-5.48)***	-0.65	(-4.32)***	0.36	(1.24)
+1	-0.49	(-2.08)**	0.21	(-0.01)	-0.71	(-4.05)***	-0.22	(-1.48)
0	**-0.24**	**(-0.08)**	**0.45**	**(2.12)****	**-1.00**	**(-5.48)*****	**-0.10**	**(-0.47)**
-1	0.98	(5.89)***	-0.19	(-0.82)	0.21	(-0.01)	0.25	(2.16)**
-2	-0.67	(-5.74)***	0.88	(4.85)***	0.45	(2.12)**	-0.10	(-0.06)
-3	-0.45	(-1.66)*	0.00	(0.00)	-0.19	(-0.82)	-1.11	(-5.14)***
-4	-0.18	(-0.42)	-0.12	(-1.45)	0.88	(4.85)***	-0.21	(-1.42)
-5	0.70	(4.98)***	-0.20	(-0.91)	0.00	(0.00)	-0.34	(-1.77)*

Therefore cumulative abnormal returns were calculated to see how the event has impacted the dividend-paying firms. Eventually, both high and low dividend yield portfolios showed significantly delayed positive impact with CARs of 2.49 per cent and 3.71 per cent, respectively, following the statement made by a government official on 29 May 2007 (see Table 11 and Figure 2). Other event dates mostly showed insignificant negative CARs.

Nevertheless, both portfolios changed their signal the day following the official presentation of the budget on 7 September 2007 (see Figure 2). High dividend yield portfolios recorded a significant CAR of -1.53 per cent, whereas, the low dividend yield portfolio recorded a higher significant CAR of -1.71 per cent. The average abnormal return for the days around the event date can be viewed in Table 11.

The portfolios indicate a similar significant impact following the confirmation of the Budget on 3 December 2007. Both high and low dividend portfolios show evidence of CARs of -0.356 per cent and -0.253 per cent, respectively. The indication of low dividend yielding portfolios is in line with the hypotheses expectation due to the loss faced by the lower marginal tax bracket. Nonetheless, we believe that the under-reaction showed by the higher dividend yielding portfolio is influenced by the global credit crunch effect (see Figure 2).

Table 11. Malaysia: CAR of high-to-low dividend yielding portfolios

The table summarises CARs of actively trading dividend paying firms in Malaysia around related event dates; statement from officials (29 May and 5 September 2007), formal budget announcement (7 September 2007), and passing of the budget (3 December 2007).

Event date		-1 to 0	0 to +1	-1 to +1	Others	
29/05/2007	top 50%	0.346	-0.424	0.0023	2.489	+2 to +8
(General tax cut announced)		(0.492)	(-0.603)	(0.0263)	(1.935)*	
	low 50%	0.743	-0.730	0.252	3.710	
		(0.779)	(-0.766)	(0.216)	(2.082)**	
05/09/2007	top 50%	-0.330	0.215	-0.030		
(Single-tier tax revealed)		(-0.484)	(0.315)	(-0.036)		
	low 50%	0.261	0.663	0.471		
		(0.280)	(0.712)	(0.413)		
07/09/2007	top 50%	-0.719	-1.529	-1.169		
(Budget presentation)		(-1.056)	(-2.199)**	(-1.402)		
	low 50%	-0.795	-1.714	-1.504		
		(-0.852)	(-1.837)*	(-1.316)		
03/12/2007	top 50%	0.126	-0.317	-0.064		
(New tax law approved)		(0.217)	(-0.545)	(-0.090)		
	low 50%	0.151	-0.322	-0.070		
		(0.192)	(-0.410)	(-0.073)		

Note: Number of firms is 517 after excluding zero dividend firms or firms that do not report dividends. Significant *t*-test is denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

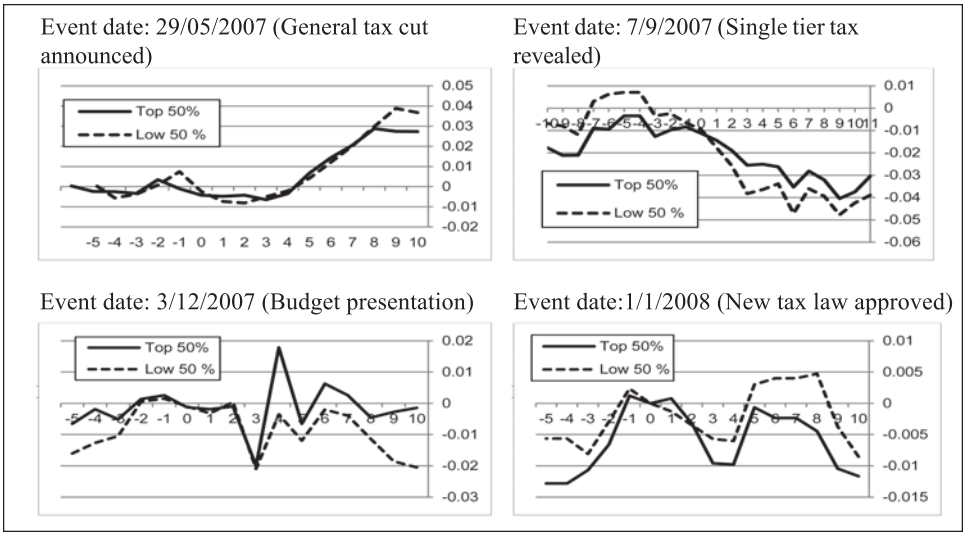

Figure 2. Malaysia: CARs of high-to-low dividend yielding portfolios

The figure illustrates the CAR of -5 to +5 around four event dates that are related to the implementation of the single-tier tax system. The difference between high and low dividend yield portfolios is shown by the line trend that accumulates from day 0.

Table 12. Singapore: Variable data descriptive statistics

	CAR	Size	SD	DY	POR
MAX	0.5508	28343064	0.9177	123.33	20.00
MIN	-0.3403	5612	0.0074	0.14	-4.00
MEDIAN	0.0205	64554	0.0234	1.90	0.00

Note: The variables are in raw value; CAR (cumulative abnormal returns); DY (dividend yield); POR (payout ratio) is given as ratio. N=186 dividend-paying firms.

5.2 Robustness Test

For the robustness test, the cumulative abnormal returns were regressed against three relevant control variables, using the Newey-West heteroskedasticity-corrected method. Our interest was to see if the results had factored in other significant variables in accord with theory. We selected only the dividend paying firms of the sample from both Malaysia and Singapore. Outliers were excluded in order to avoid outlier-driven results. Regression was done at the level of individual firms, and also at the level of a portfolio of 10. Portfolio formation was done to reduce the standard error that is evident in any individual level firm's regression analysis. Descriptive data are found in Table 12 (Singapore) and Table13 (Malaysia).

From the Singapore sample, it is observed that standard deviation is positively related to CAR, indicating that the value-risk relationship is according to theory. Also, variable firm

Table 13. Malaysia: Variable data descriptive statistics

	CAR	SD	SIZE	DY	POR
MAX	0.172	0.131	46670694	51.47	30.00
MIN	-0.245	0.000	14522	0.10	-10.00
MEDIAN	-0.034	0.022	207521	3.37	0.26

Note: The variables are in raw value; CAR (cumulative abnormal returns); DY (dividend yield); POR (payout ratio) is given as ratio. N=505 dividend-paying firms.

Table 14. Singapore: Regression analysis of CAR of dividend-paying portfolios

The CAR of event dates with confirmed news was regressed using heteroskedasticity-corrected method against controlled variables: standard deviation (as a proxy for risk), firm size, and payout ratio. Sample was reduced to firms that had reported and had paid dividends, that is 186 firms. Regressions were run based on (1) individual firms, and (2) portfolio formation of 10, in order to reduce the standard error. Significant *t*-test is denoted in bracket below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

	C	SD	SIZE	POR	Adj R	F Stat
Individual firms	3.668	0.485	-0.211	-0.001	0.451	48.118
	(2.555)**	(2.393)**	(-2.711)***	(-2.793)***		0.000
	0.012	0.018	0.007	0.006		
Portfolio formation	3.730	0.411	-0.176	-0.007	0.783	11.806
	(1.692)	(5.477)***	(-0.928)	(-3.268)**		0.006
	0.142	0.002	0.389	0.017		

size is negatively related which is in line with previous research. F-statistic also shows significant goodness-of- fit to model as shown in Table 14.

Similar testing was also done on the sample of Malaysian firms. The standard deviation was positive illustrating higher risk which in turn indicated higher CAR value. F-statistic was highly significant. Nevertheless the intercept was highly significant which may indicate a mis-specification. This might also explain the spurious relationship at both levels of regressions. Full results are shown in Table 15.

5.3 Ex-Dividend Day Share Price Behaviour

Another method to observe the impact of the change in dividend taxation is through the observation of ex-dividend day average share price drop using the Elton-Gruber method.

5.3.1 The Singapore Case

For the Singapore sample, we divided the period into three: (1) before implementation of single-tier tax, which is before year 2003; (2) the transition period, which is from year 2002 to 2007; and (3) full implementation of single-tier tax, which is from year 2008 onwards. Using the adjusted price and dividends (see Table 16), we found the average price drop moving closer to 1.00, either before or after trimming. With raw calculation, the average price drop

Table 15. Malaysia: Regression analysis of CAR

The CARs of the events were regressed, with heteroskedasticity-corrected method, against controlled variables: standard deviation (as a proxy for risk), firm size, and payout ratio. N was reduced to firms that had reported and had paid dividends, which is 505 firms. Regressions were run based on (1) individual firms, and (2) portfolio formation of 10, in order to reduce the standard error. Significant *t*-test is denoted in brackets below each coefficient. P-value is indicated by * (0.1), ** (0.05), and *** (0.01).

	C	SD	SIZE	POR	Adj R	F Stat
Individual firms	-18.657	0.835	1.063	-0.002	0.0487	9.596
	(-5.567)***	(2.753)***	(4.456)***	(-1.286)		0.000
	0.000	0.006	0.000	0.199		
Portfolio formation	-63.066	2.597	4.165	0.019	0.481	3.775
	(-4.569)***	(1.829)*	(3.514)***	(2.274)*		0.078
	0.004	0.117	0.013	0.063		

Table 16. Singapore: Average price drop (adjusted price and adjusted dividend)

Average price drop ratio was calculated using Elton-Gruber (1970) model. T-statistic noted under the calculated average price drop refers to the mean difference of average price drop to null hypothesis of 1, whereas the *t*-statistic at the final column refers to the mean difference between the sample period average price drop of 1987-2002 (pre-single tier) and 2008-2010 (single-tier tax). P-value of *t*-statistic is indicated by *(0.1), ** (0.05), and *** (0.01).

	Pre-single tier		Single tier (Transition)	Single tier	T-stat of mean difference
Time period	1987-2002	1994-2002	2003-2007	2008-2010	
Initial average	0.5514	0.6681	0.6956	0.891	(2.011)**
T-statistic	(-4.14)***	(-2.46)***	(-5.44)***	(-2.08)***	
N	2394	1837	2191	1878	
Average - outliers	0.4759	0.6125	0.7043	0.8183	(4.296)***
T-statistic	(-11.11)***	(-6.73)***	(-9.79)***	(-6.34)***	
N	2345	1798	2136	1841	
Average – outliers and non-trading days	0.6973	0.8327	0.9107	1.0976	(3.590)***
T-statistic	(-4.50)***	(-2.08)***	(-2.20)***	(2.62)***	
N	1754	1343	1632	1379	

significantly changed from 0.668 (pre-single tier tax) to 0.891 (full single-tier tax). Better results were found after trimming the outliers and non-trading days, where average price drop significantly changed from 0.832 to 1.098 after full implementation of the single-tier tax. These results are very close to our hypothesis where we expected to see a ratio of 1 upon abolition of dividend taxation.

Using unadjusted price and dividends (shown in Table 17), we did not get consistent results. Either with raw calculation or with trimmings, the average price drop for the sample period before single-tier tax was way above 1, that is, 1.543 and 1.344, respectively. After full implementation of the single tier tax, average price drop changed to 0.951 (raw calculation)

Table 17. Singapore: Average price drop (unadjusted price and unadjusted dividend)
Average price drop ratio was calculated using Elton-Gruber (1970) model. *t*-statistic noted under the calculated average price drop refers to the mean difference of average price drop to null hypothesis of 1, whereas the *t*-statistic at the final column refers to the mean difference between the sample period average price drop of 1987-2002 (pre-single tier) and 2008-2010 (single-tier tax). *p*-value of *t*-statistic is indicated by *(0.1), ** (0.05), and *** (0.01).

	Pre-single tier		Single tier (Transition)	Single tier	*t*-stat of mean difference
Time period	1987-2002	1994-2002	2003-2007	2008-2010	
Initial average	1.3924	1.5429	1.1063	0.9514	(-1.414)
t-statistic	(2.17)***	(2.37)***	(0.84)	(-0.88)	
N	2378	1825	2170	2014	
Average - outliers	0.7598	0.8948	0.8305	0.8167	(0.502)
t-statistic	(-3.73)***	(-1.25)	(-3.61)***	(-6.24)***	
N	2335	1795	2149	1970	
Average – outliers and non-trading days	1.1173	1.344	1.1085	1.1217	(0.027)
t-statistic	(1.24)	(2.71)***	(1.73)*	(3.22)***	
N	1748	1349	1642	1456	

and 1.122 (after trimming). The calculation after full implementation was similar to using the adjusted data. We believe that the recording of the unadjusted data might be different at that time, which might be the cause of the big difference from the adjusted data. Therefore, the interpretation needs to be done with caution.

5.3.2 The Malaysia Case

Using the average price drop ratio along the period of tax changes reduced the impact from the global crisis as we could test for a longer sample period. Therefore, we divided the period sample into two: (1) before the implementation of the single-tier tax, that is, before year 2008, and (2) after the implementation of the single-tier tax system, that is, after 2008. Two different sets of data, adjusted and unadjusted share prices and dividends, were used in case there were noticeable differences between the two.

Table 18 shows the average price-drop ratio using the adjusted prices and dividends. We found consistent evidence of the ratio being closer to one despite the fact that the single-tier tax system was still in the transition period. The raw calculation provided a ratio of 0.56 before the implementation which increased to 0.65 after the second-half of the transition period. After trimming the outliers, the ratio after change in tax ranged from 0.61 to 0.76, with a significant mean difference (p-value <0.01). Results looked much better after trimming of outliers and exclusion of non-trading days, signified by unchanged prices after the ex-date. The change in the average price drop ratio was from 1.08 (p-value<0.01) to 1.01 (p-value >0.1), and also with a high significant mean difference (P-value <0.01). It can be seen that the final ratio was statistically not different from one.

Using the unadjusted price and dividend (Table 19) shows similar results. After trimming of outliers, the average price drop ratio changed from 0.64 to 0.76 after the new tax system

Table 18. Malaysia: Average price drop (adjusted price and adjusted dividends)
Average price drop was calculated using the Elton-Gruber (1970)model. T-statistic refers to the mean difference of average price drop to null hypothesis of 1. P-value is indicated as * (0.1), ** (0.05) and *** (0.01). Outliers 1 is the top and bottom 2.5% standard deviation. Outliers 2 exclude Outliers 1 and non-trading days date. T-statistic at the final column refers to the mean difference between the sample period average price drop of 1997-2007 (pre-single tier) and 2010-2012 (transition of single tier).

	Pre-single tier	Transition 1	Transition 2	T-stat of mean diff.
	1997-2007	2008-2010	2011-2012	
Initial average	0.5622	0.72	0.7909	0.4653
T-statistic	(-8.39)***	(-4.485)***	-5.7877	
N	5409	1713	1592	
Average - outliers	0.6136	0.7045	0.759	(5.361)***
T-statistic	(-16.74)***	(-10.25)***	(-10.92)***	
N	5338	1697	1549	
Average – outliers and non-trading days	0.6113	0.6841	0.7598	(-2.89)***
T-statistic	(-30.76)***	(-18.09)***	(-14.94)***	
N	4869	1535	1432	

Note: P-value of *t*-statistic is indicated by *(0.1), ** (0.05), and *** (0.01).

Table 19. Malaysia: Average price drop (unadjusted price and unadjusted dividends)
Average price drop ratio was calculated using the Elton-Gruber (1970) model. T-statistic refers to the mean difference of average price drop to null hypothesis of 1. P-value is indicated as * (0.1), ** (0.05) and *** (0.01). Outliers 1 is the top and bottom 2.5% standard deviation. Outliers 2 exclude Outliers 1 and non-trading days date. T-statistic that is noted under the calculated average price drop refers to the mean difference of average price drop to null hypothesis of 1, whereas the *t*-statistic at the final column refers to the mean difference between the sample period average price drop of 1997-2007 (pre-single tier) and 2010-2012 (transition of single tier).

	Pre-single tier	Transition 1	Transition 2	T-Stat of mean diff.
	1997-2007	2007-2010	2011-2012	
Initial average	0.691	0.682	0.7671	(-0.4216)
T-statistic	(-4.924)***	(-8.66)***	(-6.605)***	
N	5409	1713	1592	
Average - outliers	0.632	0.765	0.7441	(4.382)***
T-statistic	(-15.13)***	(-8.062)***	(-11.79)***	
N	5343	1991	1551	
Average – outliers and non-trading days	0.637	0.696	0.7408	(-3.062)***
T-statistic	(-29.04)***	(-17.12)***	(-16.38)***	
N	4846	1535	1432	

Note: P-value of *t*-statistic is indicated by *(0.1), ** (0.05), and *** (0.01).

took place. The mean difference was significant at p-value < 0.05. Exclusion of non-trading days and outliers provided a ratio changes from 1.09 (p-value<0.01) to 1.02 (p-value >0.1), indicating a change in the ex-date share price behaviour following the new single-tier tax system. Despite a ratio similar to trimmed ratio, the significance level dropped, indicating a ratio not significantly different from 1.00.

6. Conclusion

From the evidence, the paper asserts the importance of tax in the pricing of shares. Tax effect has been, by far, researched by many academicians all over the world, yet, with different outcomes. The sample for this study is from two countries, which previously applied imputation tax system and later moved into the single-tier tax which eliminated dividend tax at investors' level. Singapore data indicated evidence of higher value of share price resulting from perceived good news of increased dividend cash flows. Furthermore, the average price-drop ratio indicates a diminishing tax effect as reasoned by Elton and Gruber (1970) following the closure of tax differential between capital gains and dividend tax rate as the single-tier tax was implemented. The event study on the tax announcement in Malaysia is, however, contaminated by the global reaction of the US sub-prime mortgage crisis as the USD hit a 15-year low. Nevertheless, the average price-drop still indicated a good news effect from the closure of the tax differential gap as the country went into the transitional stage of a single- tier tax from 2008. This is in accord with the theoretical explanation of tax effect (Elton-Gruber 1970).

References

Ariff, M. 1985. *An Investigation of Tax-Induced Dividend Effects in the Singapore Equity Market*. Brisbane: The University of Queensland.

Aslam S., M. Ariff and M. Shamsher. 2012. Dividend tax cuts in the United States and single-tier tax regime in Malaysia: Share price reactions to tax policy changes. *Pertanika Journal of Social Sciences and Humanities* 20(4): 1209-1228 .

Asquith, P. and W. S. Krasker. 1985. *Changes in Dividend Policy and Stock Trading Volume*. Cambridge, Massachusetts: Harvard Business School.

Asquith, P. and D. W. Mullins Jr. 1983. The impact of initiating dividend payments on shareholders' wealth. *Journal of Business* 77-96.

Bali, R. and G. L.Hite. 1998. Ex-dividend day stock price behavior: discreteness or tax-induced clienteles? *Journal of Financial Economics* 47(2): 127-159.

Barclay, M. J. 1987. Dividends, taxes, and common stock prices: The ex-dividend day behaviour of common stock prices before the income tax. *Journal of Financial Economics* 19(1): 31-44.

Bell, L. and T. Jenkinson. 2002. New evidence on the impact of dividend taxation and on the identity of the marginal investor. *The Journal of Finance* 57: 1321-1346.

Blume, M.E., J. Crockett and I. Friend. 1974. Stockholders in the United States: Characteristics and trends. *Survey of Current Business* 54 (11): 16–40.

Boehmer, E., J. Musumecci and A.B. Poulsen. 1991. Event study methodology under conditions of event-induced variance. *Journal of Financial Economics* 30(2): 253-272.

Brennan, M. J. 1970. Taxes, market valuation and corporate financial policy. *National Tax Journal* 23(4): 417-427.

Brown, J. R., N. Liang and S. Weisbenner. 2007. Executive financial incentives and payout policy: Firm responses to the 2003 dividend tax cut. *The Journal of Finance* 62 (4): 1935-1965.

Brown, S. and J. Warner. 1985. Using daily stocks: The case of event studies. *Journal of Financial Economics* 14: 3-31.

Brown, P., F. J. Finn and P. Hancock. 1977. Dividend changes, earnings reports, and share prices: Some Australian findings. *Australian Journal of Management* 2(2): 127-147.

Chen, N. F., B. Grundy and R.F. Stambaugh.1990. Changing risk, changing risk premiums and the dividend yield effect. *Journal of Business* 63: 178-206.

Eades, K., P. Hess and E. Kim.1984. On interpreting security returns during the ex-dividend period. *Journal of Financial Economics* 13: 3-35.

Elton, E. J. and M.J. Gruber. 1970. Marginal stockholder tax rates and clientele effect. *The Review of Economics and Statistics* 52(1): 68-74.

Elton, E. J., M.J. Gruber and J. Rentzler. 1984. The ex-dividend day behaviour of stock prices: A re-examination of the clientele effect: A comment. *Journal of Finance* 39(2): 551-556.

Elton, E. J., M.J. Gruber and C.R. Blake. 2005. Marginal stockholder tax effects and ex-dividend price behavior: Evidence from taxable versus non-taxable closed-end funds. *The Review of Economics and Statistics* 87(3): 579-586.

Fama, E. F. and H. Babiak. 1968. Dividend policy: An empirical analysis. *Journal of the American Statistical Association* 63(324): 1132-1161.

Farrar, D. and L. Selwyn. 1967. Taxes, corporate financial policy and returns to investors. *National Tax Journal* 20(4): 444-454.

Frank, M. and R. Jagannathan.1998. Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes. *Journal of Financial Economics* 47: 161-188.

Gagnon, J. and J. Suret. 1991. Ex-dividend day price changes and implied tax rates: An Evaluation. *Journal of Financial Research* 14: 255-262.

Gentry, W. M., D. Kemsley and C.J. Mayer. 2003. Dividend taxes and share prices: Evidence from real estate investment trusts. *The Journal of Finance* 58(1): 261-282.

Graham, J. R., R. Michaely and M.R. Roberts. 2003. Do price discreteness and transactions costs affect stock returns? Comparing ex-dividend pricing before and after decimalisation. *The Journal of Finance* 58(6): 2611-2636.

Green, R. and K. Rydqvist. 1999. Ex-day behaviour with dividend preference and limitations to short term arbitrage: The case of Swedish lottery bonds. *Journal of Financial Economics* 53: 145-187.

Griffin, P. A. 1976. Competitive information in the stock market: An empirical study of earnings, dividends, and analysts' forecasts. *The Journal of Finance* 31(2): 631-650.

Gujarathi, M. and D. Feldmann. 2006. Dividend imputation systems in industrialised countries: An examination of relative tax burdens. *Advances in International Accounting* 19: 243-259.

John, K. and L. H. Lang. 1991. Insider trading around dividend announcements: theory and evidence. *The Journal of Finance* 46(4): 1361-1389.

Kalay, A. 1982. The ex-dividend day behaviour of stock prices: Re-examination of the clientele effect. *The Journal of Finance* 37(4): 1059-1070.

Karpoff, J. and R. Walkling. 1988. Short-term trading around ex-dividend days: Additional evidence. *Journal of Financial Economics* 21: 291-298.

Karpoff, J. and R. Walkling. 1990. Dividend capture in NASDAQ stocks. *Journal of Financial Economics* 28: 39-66.

Lakonishok, J. and T. Vermaelen. 1983. Tax reform and ex-dividend day behaviour. *The Journal of Finance* 38: 1157-1179.

Lakonishok, J. and T. Vermaelen. 1986. Tax-induced trading around the ex-dividend days. *Journal of Financial Economics* 16: 287-319.

Lewellen, W. G., K.L. Stanley, R.C. Lease and G.G. Schlarbaum. 1978. Some direct evidence on the dividend clientele phenomenon. *The Journal of Finance* 5: 1385-1399.

Lintner, J. 1956. Distribution of income of corporation among dividends, retained earnings and taxes. *American Economic Review* 46: 97-113.

Litzenberger, R. H. and K. Ramaswamy. 1979. The effect of personal taxes and dividends on capital asset prices. *Journal of Financial Economics*(7): 163-195.

Litzenberger, R. H. and K. Ramaswamy. 1980. Dividends, short selling restrictions, tax-induced investor clienteles, and market equilibrium. *The Journal of Finance* 35(2): 469-482.

Litzenberger, R. H. and K. Ramaswamy. 1982. The effects of dividends on common stock prices tax effects or information effects? *The Journal of Finance* 37(2): 429-443.

MacKinlay, A. C. 1997. Event studies in economics and finance. *Journal of Economic Literature* 35(1): 13-39.

McDonald, R. 2001. Cross-border with tax arbitrage: The case of German tax credit. *Review of Financial Studies* 14: 617-657.

Miller, M. H. and F. Modigliani. 1961. Dividend policy, growth and the valuation of shares. *Journal of Business* 34(4): 411-433.

Miller, M. H. and F. Modigliani. 1966. Some estimates of cost of capital to the electric utility industry. *American Economic Review* 56(3): 333-391.

Modigliani, F. and M. H. Miller. 1958. The cost of capital, corporation finance, and the theory of investment. *American Economic Review* 48(3): 261-297.

Modigliani, F. and M. H. Miller. 1963. Corporate income taxes and the cost of capital: A correction. *American Economic Review* 53(3): 433-443.

Mohd Aswadi, K. S. 2012. Countries implementing GST or VAT. *Malaysia Goods and Services Tax, Royal Malaysian Cusotm Department*. From *http://gst.customs.gov.my/en/gst/Pages/gst_ci.aspx* [Retrived 21 Jan 2012]

Newcomer, M. 1953. The decline of the general property tax. *National Tax Journal* 6(1): 38-52.

Nissim, D. and A. Ziv. 2001. Dividend changes and future profitability. *The Journal of Finance* 56(6): 2111-2133.

Office of Management and Budget(OMB). 2013. Table 2.2. Percentage composition of receipt by source: 1934-2017 From *http://www.whitehouse.gov/omb/budget/Historicals.* [Retrieved 21 Jan 2013].

Pettit, R. R. 1977. Taxes, transaction costs and the clientele effect of dividends. *Journal of Financial Economics* 5(3): 419-436.

Poterba, J. M. and L.H. Summers. 1984. New evidence that taxes affect valuation of dividends. *The Journal of Finance* 39(5): 1397-1415.

Richardson, G., S. E. Sefcik and R. Thompson. 1986. A test of dividend irrelevance using volume reactions to a change in dividend policy. *Journal of Financial Economics* 17(2): 313-333.

Rubinstein, M. E. 1973. A mean-variance synthesis of corporate financial theory. *The Journal of Finance* 28(1): 167-181.

Seligman, E. R. A. 1890. The general property tax. *Political Science Quarterly* 5(1): 24-64.

Silverman, D. 2002. Taxes in ancient Egypt. *University of Pennsylvania Almanac* 48(28).

Steinmo, S. 2003. The evolution of policy ideas: tax policy in the 20th century. *British Journal of Politics and International Relations* 5(2): 206-236.

Taylor, J. 2002. Corporation income tax brackets and rates, 1909-2002. *IRS Statistics of Income Bulletin* 22(2): 284-290.

US Federal Individual Marginal Income Tax Rates History, 1913-2011. *The Tax Foundation*. 9 Sept 2011 [Retrieved 17 January 2013].

World Databank. World Development Indicators (WDI): Total tax rate (% of commercial profits). From : *http://data.worldbank.org/indicator/IC.TAX.TOTL.CP.ZS*[Retrieved 23 January 2013].

Zariyawati, M. A., K. Saira, K. and M.N. Annuar. 2010. Corporate tax changes and performance of SMEs in Malaysia. *Interdisciplinary Journal of Contemporary Research in Business* 2(3): 272-286.

Appendix A

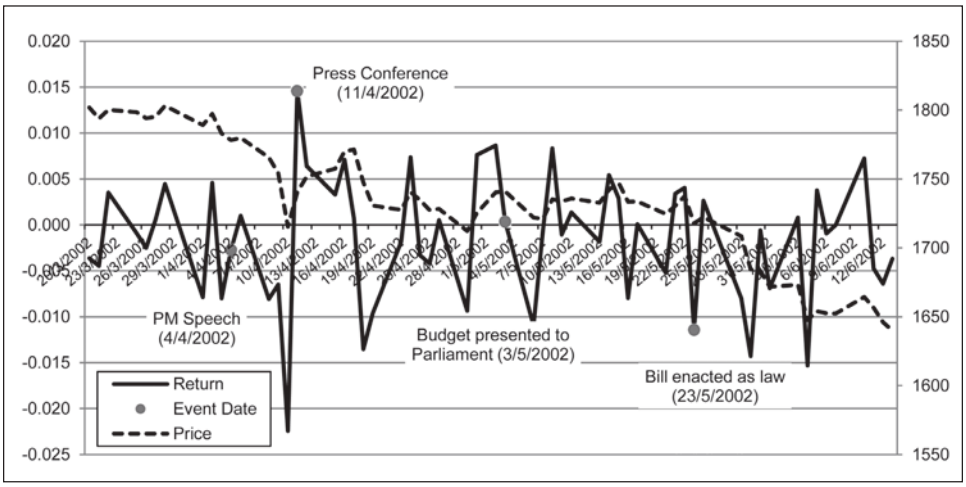

Figure A1. Singapore: Price and return index around single tier-tax announcement

Table A1. Singapore: Price and return index (in percentage) on event dates

Event date		-1	0	1
04/04/2002	Return	-0.798	-0.27	0.1006
	Price	1782.99	1778.18	1779.97
11/04/2002	Return	-2.243	1.4601	0.6397
	Price	1715.35	1740.58	1751.75
03/05/2002	Return	0.8645	0.0379	-1.095
	Price	1740.35	1741.01	1722.05
23/05/2002	Return	0.4048	-1.141	0.2634
	Price	1737.5	1717.78	1722.31

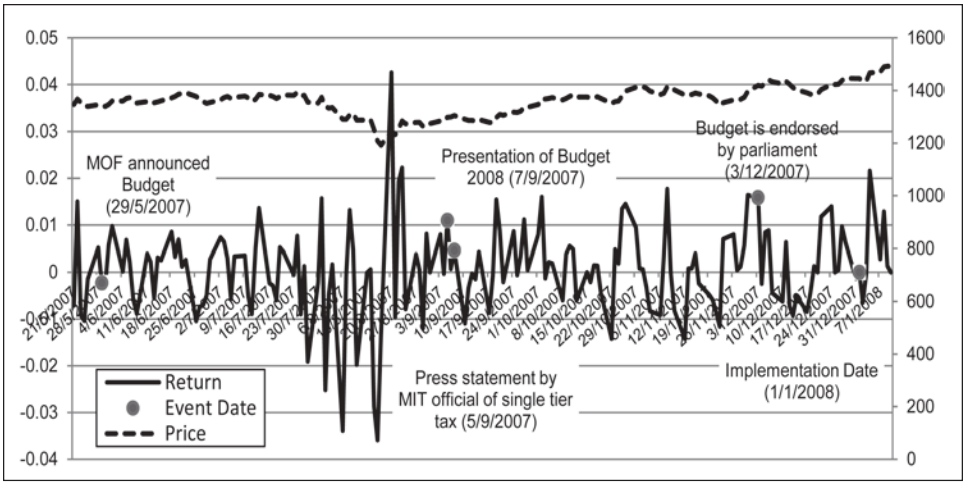

Figure A2. KLSE price and return index around single-tier tax announcement

Source: Aslam S., M. Ariff, and M. Shamsher(2012).

Table A2. Malaysia: Index price and return (in percentage) on event dates

Event date		-1	0	1
29/05/2007	Return	0.51	-0.22	-0.28
	Price	1345.99	1343	1339.18
05/09/2007	Return	-0.03	1.10	0.07
	Price	1283.75	1297.93	1298.85
07/09/2007	Return		0.46	-1.09
	Price		1304.9	1290.7
03/12/2007	Return	1.64	1.59	-0.25
	Price	1396.98	1419.34	1415.81

Source: Aslam S., M. Ariff, and M. Shamsher(2012).