The Impact of the Capital Gains Exemption on Capital Markets

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À l'aide de la méthodologie des études événementielles, nous testons l'hypothèse que la déduction pour gains en capital entrée en vigueur en 1985 a entraîné une réduction du taux effectif d'imposition des gains en capital en utilisant deux échantillons de rendements boursiers qui tiennent compte des autres effets du budget au niveau des industries et de la taille des firmes. Nous dérivons des estimés de l'impact de la déduction sur les taux effectifs d'imposition des gains en capital et sur le coût d'utilisation du capital. En utilisant des estimés existants de la relation entre le coût d'utilisation du capital et l'investissement, nous trouvons que, selon l'échantillon considéré, la déduction peut avoir amené une augmentation de l'investissement allant jusqu'à six pour cent, ou ne pas avoir eu d'effet.

Using event study methodology we test the hypothesis that the 1985 capital gains exemption decreased the marginal effective tax rate on capital gains using two samples of stock market prices that control for industry and firm level effects of other aspects of the budget. We derive estimates of the impact of the exemption on the effective capital gains tax rate, and on the user cost of capital. Using existing estimates of the relationship between the user cost of capital and investment, we find that, depending upon the sample, the exemption may have increased real investment by as much as six per cent, or had no impact at all.

I Introduction

In the May 1985 Budget, the federal government introduced a $500,000 cumulative lifetime capital gains exemption for all personal taxpayers in Canada.[1] In his budget speech, the Minister of Finance indicated that one of the purposes of the exemption was to encourage equity investment by individual Canadians, presumably with the expectation that this would in turn lead to an increase in real investment.

According to neo-classical investment theory, a tax policy initiative such as the capital gains exemption will increase real investment only if there is an associated reduction in the user cost of capital. This, in turn, will occur only if the initiative reduces the effective tax rate on capital gains for the marginal investor. Despite initial appearances, there are a number of reasons why the 1985 budget may not have decreased the capital gains rate for the marginal investor. For example, in conjunction with the capital gains exemption, the budget also eliminated the ability to write-off up to $2,000 in capital losses against other income. This may have actually increased the effective capital gains rate for some investors. In addition there are a number of tax clienteles that are tax-exempt, are not eligible for the exemption, or are able to eliminate capital gains taxes using various arbitrage strate-

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gies.

It is therefore an empirical question whether the exemption had an impact on the marginal investor and thus on the cost of capital. In this paper, we employ a stock market event study to investigate the impact of the exemption on capital markets. A reduction in the effective tax rate on capital gains for marginal investors should lead to an increase in stock prices. In particular, stock prices should rise relatively more for high capital gains stocks than for low capital gains stocks. We test this hypothesis using two different samples of firms that enable us to control for the potential industry-level and/or firm-level effects of other aspects of the budget.

From the event study analysis, we derive estimates of the impact of the exemption on the effective capital gains rate for the marginal investor and the resulting decrease in the user cost of capital. We then use existing estimates of the relationship between the user cost of capital and investment to evaluate the extent to which the capital gains exemption may have influenced real investment. The results based on one sample of firms suggest that the exemption may have increased investment by as much as 6 per cent, while the results based on the other sample provide no evidence that the exemption had any impact on marginal investors, and therefore on investment. Given our mixed results, it is difficult to arrive at strong policy conclusions regarding the impact of the exemption on capital markets.

II Capital Gains Taxation and Investment: A Neo-classical Approach

In this section we use the results from neo-classical investment theory to illustrate the way in which taxes may affect real investment. As is well-known, (see for example Auerbach, 1983, Poterba and Summers, 1985 and Boadway, 1987), a value maximizing firm will employ capital up to the point where the marginal revenue product, $\Pi'(K)$, is just equal to the user cost of capital:[2]

$$\Pi'(K) = \frac{(r+\delta-\pi)}{(1-u)}(1-\phi)\left(1-\frac{u\alpha}{r+\alpha}\right) \qquad (1)$$

The term r is the weighted average opportunity cost of finance, δ is the physical rate of depreciation, π is the inflation rate, u is the corporate tax rate, ϕ is the Investment Tax Credit (ITC) rate, and α is the Capital Cost Allowance (CCA) rate. Tax policy that reduces the user cost of capital will increase the desired level of the capital stock and therefore increase investment.

In equation (1), corporate tax parameters affect the user cost of capital directly. Personal taxes enter through their impact on the opportunity cost of finance, r.[3] The impact of personal taxes on the cost of finance depends upon the assumptions one makes regarding the marginal source of funds and the characteristics of financial markets. Unfortunately, there does not exist a widely accepted model of corporate financial behaviour. The most general approach allows for incremental investment to be financed by a weighted average of debt, retained earnings, and new share issues, all of which are taxed differently. When this is the case, Boadway (1987) illustrates that the weighted average cost of finance to the firm is equal to:[4]

$$r = bi(1-u) + (1-b)\left[a\frac{\rho}{1-c} + (1-a)\left[\frac{\rho}{1-\theta} + \pi\left[1-\frac{1-c}{1-\theta}\right]\right]\right] \qquad (2)$$

where i is the nominal interest rate on debt, b is the proportion of finance coming from debt (and therefore (1-b) is the proportion coming from equity), ρ is the nominal required after-tax rate of return on equity, is the proportion of equity finance coming from retained earnings (and therefore (1-a) is the proportion coming from new share issues), c is the *accrual equivalent* effective capital gains tax rate and θ is the effective tax rate on dividends facing the firm's (homogeneous) shareholders. The accrual equivalent tax rate on capital gains reflects both the lower statutory tax rate on real-

ized gains (currently 75% of the full statutory tax rate; 50% of the full rate in 1985), and the decrease in the present value of the taxes due to their deferral until realization. It is the tax rate that if applied to capital gains as they accrue, would result in the same present value of capital gains taxes as collected upon realization. As such, the accrual equivalent rate could be considerably lower than the statutory rate.

We see from equation (2) that a policy initiative like the capital gains exemption can affect investment by decreasing the effective capital gains tax rate (c), which lowers the opportunity cost of finance to the firm. This, in turn, reduces the user cost of capital, which causes the firm to invest in more capital.

Although the concept of the user cost of capital provides the key to understanding how changes in personal taxes on equity can affect investment, the simplicity of the simple neo-classical model can be misleading. Particularly important for our purposes is the presumption in the formulation of the user cost that there is a homogeneous group of shareholders with the same effective tax rate on capital gains. Of course, in reality the tax characteristics of individual investors can vary substantially. This gives rise to the possibility of *tax clienteles*, where investors with certain tax characteristics are more likely to hold certain types of assets than investors with other tax characteristics. Indeed, under perfect certainty, investors will completely specialize in assets according to their tax rates (see Miller, 1977). When uncertainty is introduced, investors may no longer completely specialize. Instead they may hold assets that are not tax favoured (from their perspective) but provide some diversification benefits. In this environment, if tax rates, risk preferences and transaction costs differ among investors, a group of investors may emerge as the 'marginal' investors. It is the personal tax rates of the marginal investor clientele that enter the user cost of capital expression. A *necessary condition* for the capital gains exemption to increase investment is that it reduce the effective tax rate on capital gains for the marginal investors.[5]

It is not clear, a priori, that this condition was met by the 1985 changes in the tax treatment of capital gains. In conjunction with the introduction of the exemption, the ability to write-off up to $2,000 in capital losses against other income was eliminated. This reduced the amount of loss offsetting in the tax system and may have actually increased the effective capital gains rate for some investors. In addition, some investors expect to earn more than $500,000 in capital gains. Thus, although the exemption would benefit these investors, it would not affect the return on their marginal investments. Moreover, there are a number of tax clienteles that are either tax-exempt (e.g., pension funds, universities, charities), or who are not eligible for the exemption (e.g., corporate shareholders, brokers). In addition, foreign non-resident investors pay no Canadian taxes on realized capital gains.[6] Finally, as pointed out by Miller and Scholes (1978), various nuances in the US tax code allow some investors to effectively eliminate taxes paid on investment income. As indicated by Amoako-Adu, Rashid, and Stebbins (1992), similar tax arbitrage opportunities exist in Canada.

If any of these groups form the marginal clientele, or play an important role in determining the value of the firm, the introduction of the exemption will not have an appreciable impact on the cost of capital. To assess the investment incentive effects of the capital gains exemption, it is necessary to determine the tax characteristics of the marginal investor. Of course this cannot be done directly. Our approach is to estimate the impact of the exemption on security prices to infer whether the exemption was relevant to the marginal investor.

To motivate our empirical work, consider that in equilibrium the after-tax rate of return on an investment must equal the rate of return required by the marginal shareholders:[7]

$$\rho = d_i(1-\theta) + g_i(1-c) \qquad (3)$$

where d_i is the dividend yield on security i and g_i is the expected rate of capital gain. The effective dividend and capital gains tax rates are those of the marginal investor. Rearranging this allows us to write the required expected rate of capital gain as follows:

$$g_i \equiv \frac{P_i^e - P_i}{P_i} = \frac{\rho - d_i(1-\theta)}{1-c} \quad (4)$$

Totally differentiating equation (4) with respect to c gives an expression for the proportional change in the price of the stock due to the change in the capital gains tax rate:

$$\frac{dP_i}{P_i} = -\left[\frac{P_i}{P_i^e}\right]\left[\frac{\rho - d_i(1-\theta)}{(1-c)^2}\right] dc \quad (5)$$

Thus, a reduction in the effective tax rate on capital gains for the marginal investor ($dc < 0$) of security i will lead to an increase in the stock price of security i. Moreover, the magnitude of the price increase will be negatively related to the dividend yield, as illustrated by:

$$\frac{\partial(dP_i/P_i)}{\partial d_i} = \left(\frac{P_i}{P_i^e}\right)\left[\frac{(1-\theta)}{(1-c)^2}\right] dc \quad (6)$$

This indicates that the higher the dividend yield the lower the price increase in response to the reduction in the tax rate on capital gains.

If the introduction of the capital gains exemption reduced the effective capital gains rate for the marginal investor, it should be reflected in the stock price movements suggested by equations (5) and (6). We investigate this hypothesis below. First, however, it is useful to discuss briefly the results of some of the previous literature that has examined the impact of equity taxes on stock prices.

III Previous Studies of the Impact of Equity Taxes on Stock Prices

The literature has followed three basic approaches. The first is to examine the relationship between (risk adjusted) before-tax rates of return and dividend yields. If the effective tax rate on dividends exceeds the effective tax rate on capital gains for the marginal investor, then, all else being equal, the before-tax rate of return should be positively correlated with the dividend yield – before-tax rates of return must be higher to compensate for the higher tax rate on dividends relative to capital gains.

The empirical evidence based on this approach has been mixed. For example, Black and Scholes (1974), Gordon and Bradford (1980), Miller and Scholes (1982), and Chen, Grundy and Stambaugh (1990) find support for the notion that the dividend/capital gains tax differential does *not* affect before-tax returns, while Litzenberger and Ramaswamy (1979;1980; 1982) find evidence to the contrary. Morgan (1980), in a study of Canadian stock prices, finds that the introduction of capital gains taxation in 1971 altered prices in a way that suggests that tax differentials are important.

The second approach is to examine the ex-dividend behaviour of stock prices. Without personal taxes on equity, arbitrage arguments imply that the value of a stock should fall by the full amount of the dividend on the ex-dividend day. If the effective tax rate on dividends exceeds that on capital gains, similar arguments suggest that the reduction in the price should be less than the amount of the dividend.[8] Elton and Gruber (1970) find evidence that the dividend/capital gains tax differential was important for the marginal investor in the US – stock prices did indeed fall by less than the amount of the dividend. This implies that the dividend/capital gains tax differential was positive for the marginal investor. More recently, however, Hearth and Rimbey (1993) find no evidence that ex-dividend day behaviour is related to differences in the tax treatment of dividends and capital gains. Poterba and Summers (1984) analyse the impact of British tax reforms and find that changes in dividend taxation had a significant impact on ex-dividend price movements while changes in capital gains taxes did not.

Two Canadian studies that employ the ex-dividend day approach obtain contradictory results. Lakonishok and Vermaelen (1983) investigate whether the introduction of capital gains taxes in 1971 resulted in a change in the ex-dividend behaviour of stock prices. They find no evidence of such a change. Booth and Johnston (1984), on the other hand, find that ex-dividend behaviour is indeed sensitive to the tax differential.[9] In particular, their analysis suggests that the 'response of the ex-dividend day price ratio to tax changes is consistent with a marginal investor who is an individual with a very low effective tax rate on capital gains' (Booth and Johnston, 1984:475).

The third approach to examining the relationship between taxes and equity values is to employ event study analysis. Changes in the tax law provide 'natural experiments' for investigating the impact of taxes on stock market prices. If taxes are relevant to the marginal investor, changes in the differential tax treatment of dividends and capital gains should be reflected in security prices as soon as the tax changes are announced (or anticipated). Poterba and Summers (1985) use this approach to analyse various tax changes in the United Kingdom. They find that the impact of announcements of dividend tax reductions on stock prices is positively (although not statistically significantly) related to dividend yields, as suggested by the tax relevance hypothesis. In McKenzie and Thompson (1994), we analyse the impact of the Canadian dividend tax increase in 1986. We find strong evidence that dividend taxes affect equity values. In particular, our results suggest that the marginal investor clientele for our sample of firms consisted of Canadian individuals in the highest tax bracket.

Two papers employ the event study approach to assess the impact of capital gains taxes in Canada. Amoako-Adu (1983) uses monthly data to examine the introduction of capital gains taxes in 1971, as well as subsequent changes in 1977. He finds that changes in the relative taxation of dividends and capital gains had a differential impact on high and low dividend yield portfolios in a manner consistent with an increase in the effective capital gains rate.

Amoako-Adu, Rashid and Stebbins (1992) employ a similar approach to examine the introduction of the capital gains exemption in 1985 and the subsequent freezing of the exemption in 1987. This study is, of course, particularly relevant to our discussion. For the 1987 tax changes they find significant announcement effects that suggest that the effective capital gains tax had been increased relative to dividend taxes.[10] They do not find significant effects corresponding to the 1985 budget announcement, but they do interpret significant abnormal returns ten days prior to the announcement as evidence that the market anticipated the capital gains exemption. They conclude that the capital gains exemption had a positive effect on high capital gains stocks relative to low capital gains stocks. As they note in their paper, however, a careful search of the financial press during the period surrounding the budget announcement provides no indication that the exemption was expected. Consequently, our view is that their results do not provide evidence that the 1985 capital gains exemption had an impact on equity prices. We therefore feel that this issue merits further investigation. This is the objective of the next section.

IV Analysis of the 1985 Capital Gains Exemption and Stock Prices

In this section we investigate the impact of the announcement of the capital gains exemption on stock prices. The announcement was made in the 1985 Federal budget, which was released on the evening of May 23. Some event study researchers estimate abnormal returns for event 'windows' that include days preceding and following the event day to allow for the possibility that the event was anticipated or that there were adjustment lags in assimilating the in-

Table 1
Returns to indexes of the Toronto Stock Exchange

	Event day 5/24/85	Mean daily return 4/84–4/85	Standard deviation 4/84–4/85
TSE 300	0.0093	0.0004	0.0062
Equal-weighted index	0.0061	0.0017	0.0082

formation. Simulations by Brown and Warner (1980;1985), however, indicate that the power of an event study is substantially weakened when the event window is unnecessarily lengthened. As discussed above, there is no evidence that the capital gains announcement was anticipated. With efficient capital markets (a crucial assumption of the event study technique), stock markets should react immediately to new information. Expectations about the impact of the capital gains exemption therefore should be reflected in stock market prices on the day following the announcement, Friday, May 24, 1985. We focus on this date in our analysis below.

To provide a benchmark, the returns to two broad indexes of the Toronto Stock Exchange are reported in Table 1. The TSE 300 rose by approximately 0.93 per cent and the equally-weighted index of all of the stocks on the Toronto Stock Exchange rose by 0.61 per cent, although neither of these increases is statistically different from its average return during the previous 12 months. It is not possible to relate changes in the overall stock market directly to the capital gains exemption due to the many other aspects of the budget that may have affected the stock market.

To isolate the impact of the capital gains exemption from other aspects of the budget announcement, we estimate the differential impact of the budget announcement on the prices of high and low capital gains stocks. Our approach is to estimate the relationship between abnormal stock returns and dividend yields. All else being equal, low dividend stocks are expected to generate larger capital gains. As discussed above, if the exemption reduced the effective capital gains tax for the marginal investors, we should observe a greater price reaction for low dividend stocks than for high dividend stocks.

A common problem encountered in event study analysis is that it is often difficult to control for other new information that may be reflected in stock market prices. This is particularly important for our analysis because the capital gains exemption was announced in a federal budget that included other important information. The impact of other information on stock prices may bias the analysis if this information is related to firm- or industry-specific characteristics that are correlated with dividend yields. It is possible to control for some of these effects. For example, Amoako-Adu (1983) controls for industry effects by comparing high and low dividend portfolios for the same industries; McKenzie and Thompson (1994) control for firm-specific effects by comparing common and preferred stocks issued by the same companies.

In this paper, we construct two samples of firms that enable us to control for the potential impact of other information. Our first sample consists of common stocks included in the TSE 300 subindexes. Identifying stocks according to these industry groupings allows us to control for industry-specific effects of other news included in the budget or coinciding with the budget announcement. For our second test, we follow the approach employed in our previous work (McKenzie and Thompson, 1994) and compare the abnormal returns to common and preferred shares issued by the same company. Preferred stocks generally have high dividends relative to common stocks.

This is confirmed by the dividend data discussed below. As such, we expect the capital gains exemption to have a greater impact on common stocks than preferred stocks. In addition, because we are studying common and preferred stocks from the same companies, we are able to estimate the relationship between abnormal stock market returns and dividend yields while controlling for the potential firm-specific effects of other aspects of the budget.

Method

The abnormal return to security i at time t, ar_{it}, is defined to be the prediction error of the market model:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \epsilon_{it} \quad (7)$$

where r_{it} is the return to security i at time t, r_{mt} is the return to the market portfolio, β_i represents the systematic risk of security i, and $\in_{it}$ is a stochastic error term, assumed to have a zero mean and a constant variance.

This prediction equation is used to estimate abnormal returns for the event day, May 24. In addition, as a form of sensitivity analysis, we consider a two-day event window that includes both the event day and the following trading day, Monday May 27.[11] This two-day window allows for the possibility that some of the reaction to the budget announcement is reflected in security prices on the day following the event day. We consider this possibility because approximately 25 per cent of the securities in our samples did not trade on the event day. For this window, abnormal returns are estimated for the two individual days and added together to create a cumulative abnormal return.

To estimate the relationship between abnormal returns and dividend yields, individual abnormal returns are specified to be a function of dividend yields and industry- or firm-level fixed effects:

$$ar_i = \delta_{0j} + \delta_1 div_i + \mu_i. \quad (8)$$

The term, δ_{0j}, represents the impact of news specific to firm or industry j during the event window. For comparison, we also estimate this equation with the restriction that this intercept term is the same for all observations. The coefficient, δ_1, captures the relationship between abnormal returns and dividend yields. If the capital gains exemption reduced the effective tax on capital gains relative to dividends for the marginal investors, this coefficient will be negative. To control for heteroscedasticity, equation (8) is estimated by feasible generalized least squares.[12]

Table 2
Industry affiliations of stocks

	Sample 1	Sample 2
Metals and Minerals	25	8
Gold	20	0
Oil and Gas	47	10
Paper and Forest Products	9	8
Consumer Products	17	3
Industrial Products	36	18
Real Estate/Construction	7	4
Transportation	8	2
Pipelines	5	4
Utilities	11	14
Communications/Media	15	4
Merchandising	25	4
Financial Services	28	14
Management Companies	9	6
High Technology	8	0
Total	270	102

Note: Sample 2 consists of a preferred stock and a common stock for each of 51 firms.

Description of Data

The stock market data used in the study are drawn from the daily return file of the TSE/Western database. The estimation period for the prediction equation begins on April 2, 1984 and ends on May 18, 1985. Our first sample (Sample 1) consists of all of the stocks included in the TSE indexes during May 1985 for which we were able to identify both the return and dividend data.[13] The total number of stocks in this sample is 270. The industry breakdown is listed in Table 2. There is some overlap between the stocks included in the TSE high technology index and the other indexes. We include in

Table 3
Dividend yields (%)

	Mean	Low	High
Sample 1			
Full Sample	2.59	0.00	14.12
Metals and Minerals	2.29	0.00	11.34
Gold	1.12	0.00	4.44
Oil and Gas	1.06	0.00	5.33
Paper and Forest Products	4.38	0.00	9.38
Consumer Products	4.07	2.00	6.26
Industrial Products	2.36	0.00	6.86
Real Estate/Construction	1.36	0.00	2.65
Transportation	3.29	0.00	8.89
Pipelines	5.45	4.07	6.82
Utilities	7.51	6.18	9.35
Communications/Media	2.06	0.00	4.17
Merchandising	2.59	0.00	4.55
Financial Services	3.64	0.00	14.12
Management Companies	3.72	1.33	5.80
High Technology	0.02	0.00	0.14
Sample 2			
Common	4.10	0.00	8.86
Preferred	10.21	7.14	16.51

SOURCE: *Toronto Stock Exchange Review*, December 1984.

Table 4
Abnormal returns

	Mean Abnormal Return[a]	
	1-Day	2-Day
Sample 1		
Metals and Minerals	0.0006	-0.0045
Gold	-0.0151	-0.0174
Oil and Gas	0.0045	0.0057
Paper and Forest Products	0.0026	0.0151
Consumer Products	0.0050	0.0050
Industrial Products	0.0044	0.0082
Real Estate/Construction	0.0140	0.0158
Transportation	0.0194**	0.0171
Pipelines	0.0125	0.0188
Utilities	0.0024	-0.0005
Communications/Media	0.0038	-0.0028
Merchandising	0.0076	0.0128*
Financial Services	-0.0002	0.0036
Management Companies	0.0067	0.0207**
High Technology	0.0094	0.0090
Sample 2		
Common	0.0032	0.0112
Preferred	-0.0010	0.0016
Correlation[b]	0.2399*	0.1054

* Statistically significant at the 10% level.
.** Statistically significant at the 5% level.
Notes:
[a] Abnormal returns are estimated for equally-weighted portfolios as the residuals of the market model. The TSE/Western equally-weighted index is used as the market index. The two-day abnormal returns are cumulated from the event day (May 24, 1985 the following trading day (May 27, 1985).
[b] This represents the correlation between the abnormal returns to common and preferred stocks issued by the same companies.

Table 4 contd.

Notes contd.:

the high technology group only those stocks that are not included elsewhere.

Our second sample (Sample 2) consists of firms that had both common and preferred stock outstanding during the estimation and event periods.[14] Securities were excluded from the sample if they were listed as tax deferred or in arrears by the Financial Post Information Service (1985). We also excluded short-term preferred shares which may have been issued as a form of after tax financing by tax loss firms. Our original sample consisted of 63 firms. Unfortunately, many of the stocks in this sample were traded very infrequently. We thus consider only those securities that were traded on at least 50 per cent of the

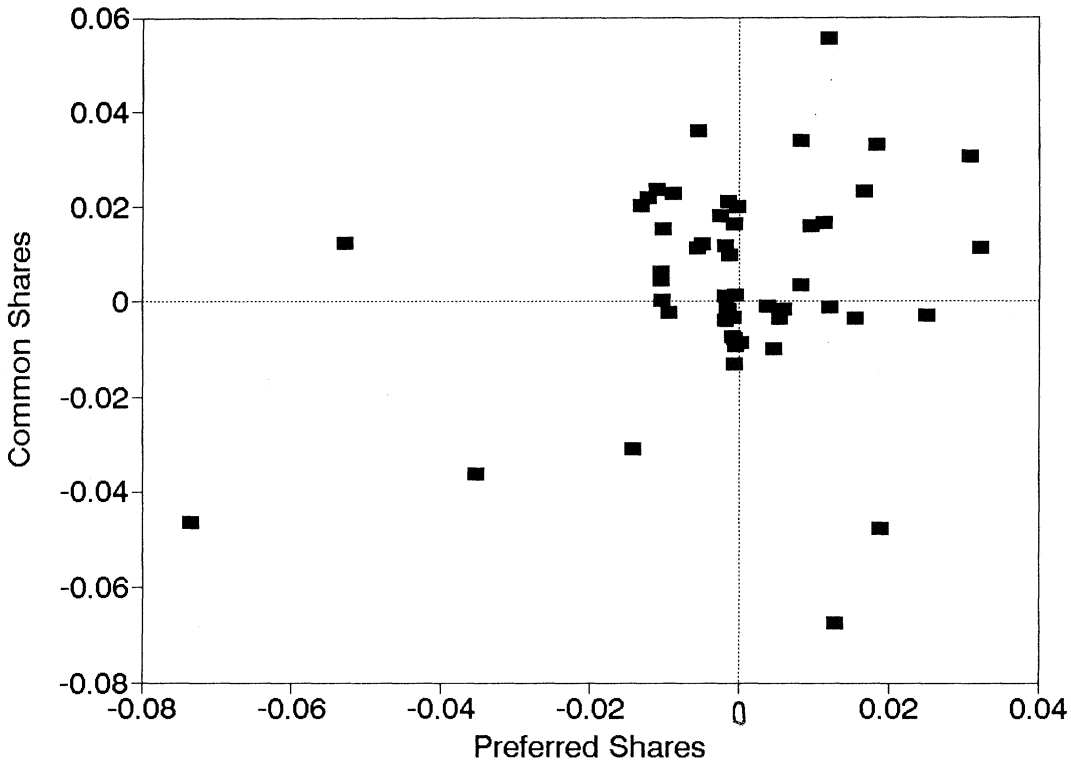

Figure 1 One-day abnormal returns

days during the estimation period. Our final sample consists of 51 firms. The industry affiliations of these firms are listed in Table 2. Approximately 86 per cent of the common stocks (and none of the preferred stocks) are also included in Sample 1.

The dividend yield data are from the December 1984 issue of the *Toronto Stock Exchange Review*. As reported in Table 3, the dividend yields for Sample 1 range from 0 to 14.12 per cent. There is also a fairly high degree of variation among the average dividend yields by industry, ranging from 0.02 per cent (high technology) to 7.51 per cent (utilities). For Sample 2, the average dividend yield is greater for preferred shares than common shares, as expected. In addition, the dividend yields for all but one of the preferred shares are greater than the dividend yields for their common share counterparts.

Results

The abnormal returns are summarized in Table 4. The means presented represent the abnormal returns to equally-weighted portfolios. The industry-level average abnormal returns for Sample 1 range from -1.7 per cent (gold) to 2.1 per cent (management companies). This suggests the possibility that the budget announcement may have had important industry-specific effects.[15]

For Sample 2, it is useful to summarize the abnormal returns for the common and preferred stocks separately. The mean abnormal return for common stocks is greater than the mean abnormal return for preferred stocks for both event windows. While this is consistent with the hypothesis that the exemption reduced the effective capital gains rate for marginal investors, the differences between the abnormal returns

Table 5
Relationship between abnormal returns and dividend yields

	Sample 1	Sample 2
One-day Window		
Dividend Coefficients		
Model 1	NA	-0.0860*
		(0.0485)
Model 2	-0.0106	-0.0065
	(0.0643)	(0.0410)
Model 3	0.0052	-0.0240
	(0.0463)	(0.0365)
F–Statistics		
Model 1 vs Model 2	NA	2.322**
Model 2 vs Model 3	1.613	1.441
Sensitivity Analysis: Two-day Window		
Dividend Coefficients		
Model 1	NA	-0.1135*
		(0.0687)
Model 2	0.0026	-0.0649
	(0.0912)	(0.0581)
Model 3	0.0446	-0.1014*
	(0.0654)	(0.0518)
F–Statistics		
Model 1 vs Model 2	NA	1.108
Model 2 vs Model 3	1.950**	0.907

* Statistically significant at the 10% level.
** Statistically significant at the 5% level.
Notes:
Model 1: Equation 8 includes firm-specific fixed effects.
Model 2: Equation 8 includes industry-specific fixed effects.
Model 3: Intercept in equation 8 is constrained to be the same for all observations.

are not statistically significant.[16] It is important to note that there is a great deal of variation among the abnormal returns for both the common and preferred shares. As indicated by Figure 1, the one-day abnormal returns range from -0.068 to 0.056 for common shares and from -0.073 to 0.032 for preferred shares.

Figure 1 also illustrates that the abnormal returns to common and preferred stocks issued by the same companies are positively correlated. In other words, companies that have relatively large abnormal returns to their common shares also tend to have relatively large abnormal returns to their preferred shares. As indicated in the last row of Table 4, however, this correlation is significant at only the 10 per cent level for the one-day window and is positive, but not significant for the two-day window. Although these correlations are statistically weak, they do suggest that common and preferred stocks of the same company may be affected by some of the same factors (after controlling for market wide conditions), and, therefore, that firm-specific effects may be important.[17]

The relationships between abnormal returns and dividend yields are presented in Table 5. None of the dividend yield coefficients for Sample 1 are statistically different from zero. Based on this test, therefore, there is no evidence that the capital gains exemption had an impact on equity values. This conclusion is robust to whether the estimation equation includes industry fixed effects (model 2) or constrains the intercept to be the same for all observations (model 3). The *F*-statistics reported in the table indicate that the industry effects are jointly significant at the 5 per cent level for only the two-day window. There are, however, significant individual industry intercepts for both windows. Thus, these results provide some evidence that industry effects are important for this event although these effects do not alter the implications of our results with respect to the capital gains exemption.

Turning to the results based on Sample 2 and focusing on the one-day window (our base case), the dividend yield coefficients for all three models are negative (see Table 5). This coefficient is statistically significant when the estimation allows for firm-level fixed effects (model 1), although only at the 10 per cent level. The *F*-statistics indicate that the firm-level fixed effects are jointly significant. The restriction that these effects are equal for all firms within the same industry is rejected at the 1 per cent level of significance. In this case, controlling for firm-specific shocks does alter the implications of our results with respect to the capital gains exemption: the results

for model 1 are stronger than the results for models 2 and 3. This illustrates the potential importance of other information released during the event window and provides support for our approach. For the two-day window, all of the coefficients are negative, and are statistically significant for models 1 and 3 at the 10 per cent level. In this case, the firm-specific effects are not jointly significant.

In contrast to the results based on Sample 1, the results based on Sample 2 provide some evidence that the capital gains exemption had a positive impact on high capital gains stocks relative to low capital gains stocks. Although the estimates are only marginally significant, the possibility that the exemption had an impact on the cost of capital cannot be dismissed. The estimate for the one-day window implies that for every percentage point of dividend yield, the abnormal return is 0.086 percentage points lower.[18] Using this coefficient and equation (6) above,

$$\frac{\partial(dP_i/P_i)}{\partial d_i} = \left(\frac{P_i}{P_i^e}\right)\left[\frac{(1-\theta)}{(1-c)^2}\right]dc = 0.086. \quad (9)$$

This expression can be used to derive an implied value of the accrual equivalent capital gains tax rate c. Our previous study (McKenzie and Thompson, 1994) suggests that the marginal investor clientele for a similar sample of firms consisted of investors in the highest tax bracket. The dividend tax rate for investors in this bracket is $\theta = 0.25$. If the exemption eliminated capital gains taxes for the marginal investor, then dc (the change in the effective tax rate on capital gains) must equal $-c$ (the effective tax rate on capital gains prior to the exemption). For approximation purposes, we assume that the ratio of the stock price to its expected future value is equal to 0.90, and derive an implied accrual equivalent effective capital gains rate of about 10 per cent.[19] This value is within a reasonable range of the rates suggested in previous studies. For example, McKenzie and Mintz (1992) use a value for the accrual equivalent rate of 8 per cent. King and Fullerton (1984) suggest that, due to the deferral of capital gains taxes until realization, the accrual equivalent rate is about one-half of the statutory rate. The full tax rate for a top bracket personal taxpayer in 1985 was about 50 per cent (depending upon the province), implying a statutory capital gains rate on realization of 25 per cent (in 1985 capital gains were taxed at half the full rate). Following King and Fullerton, the accrual equivalent rate would be 12.5 per cent. The 10 per cent effective rate implied by our estimates thus appears to be economically meaningful.

It is interesting to ask why the results based on the two samples differ. One possible explanation is that the firm-specific effects reflected in the abnormal returns are important and are correlated with the dividend yield variable. If this is the case, the dividend coefficient is biased when the estimation does not control for these effects. Since the tests for Sample 2 control for firm-specific effects while the tests for Sample 1 do not, this may explain the different results. This explanation is consistent with the fact that the results for Sample 2 are stronger when the estimation allows for firm-level fixed effects rather than industry-level fixed effects.

Another possibility is that the results for Sample 2 reflect other aspects of the budget that affected common and preferred shares differently. Our reading of the budget, however, suggests that this is not likely. A related possibility is that other changes in economic conditions on the event day had a differential impact on preferred and common shares. For example, preferred shares are likely to be more sensitive to interest rate changes due to their similarity to bonds. To investigate the possibility that our results reflect the differential impact of interest rate changes (rather than the capital gains exemption), we augmented our prediction equation with an interest rate variable (the yield on 30-day commercial paper) and estimated the relationship between the resulting abnormal returns and dividend yields. The results are very simi-

lar to those presented in Table 5 and do not alter our conclusions.

Another possible explanation for the differences between the two samples is that we are capturing clientele effects. The characteristics of a company and its shareholders may somehow differ between firms that issue both common and preferred shares and those that do not. One possibility relates to the small open economy hypothesis. Booth and Johnston (1984) provide evidence from the 1970s that prices of interlisted stocks are determined by international investors while prices of non-interlisted stocks are determined by domestic investors. Approximately 23 per cent of the securities included in Sample 1 are interlisted on US stock exchanges while only 11 per cent of the securities in Sample 2 are interlisted.[20] The open economy hypothesis suggests that Sample 1 may be less sensitive to domestic tax changes than Sample 2. To investigate this issue further, we included an interactive dummy variable for interlisted stocks and dividend yields in equation (10) for Sample 1. The results indicate that there is not a significant difference between interlisted and non-interlisted stocks. It should be noted, however, that these results do not necessarily imply a rejection of the open economy hypothesis. It is possible, for example, that the distinction between interlisted and non-interlisted securities is no longer relevant; international investors may determine prices for a larger range of securities.

The open economy hypothesis is only one of the possible clientele effects that may be reflected in our results. If clientele effects are present, this suggests that the capital gains exemption may have reduced the effective capital gains tax rate for investors in only a subset of firms that are somehow represented by our sample of common and preferred stocks. Following this interpretation, our analysis suggests that the capital gains rate was reduced from approximately 10 to 0 per cent for investors in Sample 2 firms, while the marginal investors in Sample 1 firms were not affected by the exemption. On the other hand, it is possible that the impact of the exemption was more widespread, but that this effect is difficult to detect in Sample 1 due to other information reflected in the abnormal returns.

V Implications for the Cost of Capital and Real Investment

As discussed above, according to neo-classical investment theory an initiative such as the capital gains exemption will increase real investment only if it reduces the user cost of capital by decreasing the effective capital gains rate for the marginal investor. The magnitude of the impact on investment depends on both the size of the reduction in the user cost and the relationship between the user cost and investment. In this section, we discuss the implications of our results for the user cost of capital. We then employ previous estimates of the elasticity of investment with respect to the user cost to speculate upon the potential impact of the exemption on real investment.

An assessment of the impact of the capital gains exemption on investment is complicated by a number of difficulties. One is the determination of the accrual equivalent effective tax rate on capital gains prior to the exemption. For example, if this tax rate was very low prior to the exemption, then the introduction of the exemption would have little impact on the user cost of capital (even if it was relevant for the marginal investor), and therefore little impact on investment.

The event study approach taken above allows us to surmise what the effective tax rate on capital gains may have been prior to the exemption. As discussed, the estimates based on one sample of stocks suggest that the capital gains exemption may have reduced the effective tax rate on capital gains for marginal investors by as much as 10 percentage points, while the results based on another (broader) sample of firms suggests that there was no impact on the marginal investor. In Table 6 we present calculations of the user cost of capital,

Table 6
User cost of capital (%)

	Before	After	Difference (% change)
a = 1.0	15.68	14.71	-0.97 (6.2)
a = 0.8	15.92	15.05	-0.87 (5.5)
a = 0.5	16.30	15.56	-0.74 (4.5)
a = 0.0	16.91	16.41	-0.50 (2.9)

These are the upper bound of changes in the cost of capital due to the capital gains exemption, assuming a reduction in the effective tax rate on capital gains of ten percentage points. The lower bound in zero. Assumes $i = .093$, $\rho = .12$, $b = .412$, $\pi = .05$, $\delta = .095$, $\phi = .07$, $a = .36$, $u = .42$, and $\theta = .25$ (weighted averages based upon data from Department of Finance [1989]). The parameter a is the proportion of equity finance coming from retained earnings; (1-a) is the proportion coming from new share issue.

based on equations (1) and (2), both before and after the introduction of the exemption, assuming that the effective capital gains rate fell from 10 per cent to zero. As such, the calculations represent an *upper bound* estimate of the reduction in the cost of capital due to the exemption; the lower bound is zero. Calculations are presented under a number of different assumptions regarding the proportion of marginal investment financed by retained earnings relative to new share issues. The remaining parameters are set at 'reasonable' levels based upon weighted averages for the corporate sector using data from the Department of Finance (1989). The calculations indicate that a 10 percentage point reduction in the capital gains rate would reduce the user cost of capital by 3–6 per cent.

In a recent survey of the investment literature, Chirinko (1993:1881) concludes that the 'response of investment to price variables tends to be small and unimportant relative to quantity variables'. The estimated elasticity of investment with respect to the user cost of capital has generally been less than 0.50 (in absolute value) and often close to zero. Recent papers by Auerbach and Hassett (1991) and Cummins and Hassett (1993), however, employ more disaggregated data and find a stronger relationship between the user cost of capital and investment. For example, Cummins and Hassett (1993) obtain elasticities estimates based on firm-level data of approximately -1.1 for equipment and -1.2 for structures. There is thus some evidence that changes in the cost of capital may have an important impact on investment, although the estimated magnitudes vary widely.[21]

To obtain an indication of the maximum impact of the lifetime capital gains exemption on investment, we employ our upper bound estimate of the change in the user cost of capital (6%) and an investment elasticity of -1.0 (which is large relative to most estimates). This implies that the introduction of the capital gains exemption may have increased gross investment by as much as 6 per cent. As indicated above, however, this estimate should be viewed as an upper bound. It is also possible that the exemption had a negligible impact on investment in the Canadian economy. This possibility arises because (1) the overall impact of the exemption on marginal investors in the economy may have been small (as suggested by the analysis of the TSE 300 stocks); and/or (2) the relationship between the user cost of capital and investment is weak (as suggested by many investment studies).

VI Summary and Conclusions

In this paper we investigate the impact on capital markets of the capital gains exemption introduced in the 1985 budget. Our approach is to focus on the effect of the exemption on the cost of capital by analysing the impact of the budget announcement on stock market prices. We study two samples of firms that enable us to control for the potential industry- and/or firm-specific effects of other news released in the budget.

Our empirical results are mixed. The results based on one sample (consisting of

common and preferred stocks issued by the same companies) provide some evidence that the capital gains exemption may have had a positive impact on high capital gains stocks relative to low capital gains stocks. Although these results are marginally significant in a statistical sense, their magnitudes are economically meaningful. Thus, we cannot dismiss the possibility that the capital gains exemption had an impact on the marginal investor. Our estimates suggest that the effective capital gains tax rate may have fallen by as much as 10 percentage points. In this case, the increase in real investment may have been very small or as high as 6 per cent, depending on the elasticity of investment with respect to the cost of capital.

In contrast, we find no evidence that the exemption had an impact on a broader sample consisting of the stocks included in the TSE 300 indexes. A possible interpretation of these results is that the capital gains exemption had an impact on only a subset of the economy that is represented by our sample of firms that issue both common and preferred stocks. An alternative interpretation is that the exemption had a broader impact on the economy, but that this impact is obscured by other information reflected in the abnormal returns of the TSE 300 firms. It is therefore difficult to draw strong conclusions about the effect of the capital gains exemption on the cost of capital and, therefore, on investment. Our estimates suggest that the increase in investment spending may have been negligible or as high as 6 per cent. More research is required before we can decide the issue with more confidence.

Notes

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1 See other papers in this volume for more information regarding the details of the exemption.

2 The neo-classical investment model is well-known, so we do not work through the derivation here. Equation (1) is derived by maximizing the value of the firm. For simplicity, we assume that there are no adjustment costs or risk, and that investments are fully reversible.

3 As pointed out by Zodrow (1994), this is a partial equilibrium view which ignores the possibility of 'feedback' effects in the economy due to changes in rates of return as savings and investment change.

4 A particularly important factor in determining the impact of personal taxes on the cost of capital is the role of dividend taxes. There is disagreement amongst economists as to the way that dividends should be modelled. The 'traditional view' is that dividend taxes affect investment decisions through the cost of capital, which reflects a weighted average of the tax rate on dividends and capital gains. The 'new' view holds that dividend taxes do not enter the cost of capital expression. Capital gains taxes play a larger role under the new view. Equation (2) is reflective of the traditional approach, which seems to be the consensus view. A discussion of this debate is beyond the scope of this paper; see Zodrow (1991). In later sections, we deal with the problem by presenting cost of capital estimates under different assumptions regarding the weights.

5 As pointed out by a referee, it is also possible that the tax initiative may change the identity of the marginal investor. For our purposes it does not matter whether the marginal tax rate on capital gains decreases either because of a change in the identity of the marginal investor or a reduction in their effective tax rate.

6 In a theoretical model of a small open economy, Boadway and Bruce (1991) argue that domestic taxes on dividends and capital gains will have no impact on the cost of capital. This is because the required before-tax rate of return on equity is determined by international capital markets. Domestic taxes on equity merely help determine the proportion of investments financed by domestic investors vis-à-vis foreign investors.

7 For simplicity, we continue to assume that returns are certain here. It is straightforward to introduce uncertainty by way of some equilibrium asset pricing model. For example, if we employed the CAPM we would replace ρ with $r_f + (R_m - r_f)\beta_i$, where r_f is the after-tax risk free interest rate and

β_i is the security's 'beta'.

8 See Scholes and Wolfson (1992:359–68) for a discussion of this approach and its shortcomings.

9 Booth and Johnston discuss a number of reasons why their results differ from Lakonishok and Vermaelen.

10 The 1987 budget also eliminated the $1,000 dividend and interest exemption. It is therefore not clear, a priori, how the budget altered the dividend-capital gains tax differential.

11 We also experimented with a four-day window that includes these two days plus the two days preceding the announcement. According to the *Globe and Mail*, stock prices fell during the two days prior to the budget due to an anticipated dividend tax increase. It is thus possible that price movements on May 24 reflected 'relief' that this did not occur. This would increase high dividend stocks relative to low dividend stocks and might obscure the effect of the capital gains exemption. By including the two days prior to the budget in the event window, the potential impact of changes in expectations about dividend taxes should offset one another. We find no evidence, however, that expectations about dividend taxes had a significant effect on stock prices.

12 This procedure involves dividing the observations by the estimated standard errors of the abnormal returns. An alternative approach that is often used in event studies is to estimate the abnormal returns and their relationship to the explanatory variables in one step as a system of seemingly unrelated regressions (SUR). This approach is not feasible for our study, however, due to the large number of equations to be estimated.

13 Identifying some of these data proved to be difficult due to changes in corporate structure.

14 If a firm issued more than one common or preferred stock during the sample period, the most frequently traded stock was chosen for the sample.

15 In earlier analysis, we included the Standard and Poor index and subindices in the prediction equation for the one-day abnormal returns to control for shocks that may be common to both the US and Canadian markets. The general patterns of abnormal returns were similar to those reported in Table 4.

16 The differences between these means for the one- and two-day windows are 0.0042 and 0.0096, with standard errors of 0.0059 and 0.0083 respectively. The standard errors have been corrected for possible correlation among the individual abnormal returns.

17 We formally test the significance of firm specific effects below and find that they are indeed important.

18 We focus on this estimate because we consider the one-day window our base case. The two-day window estimates would imply a somewhat larger impact.

19 This allows for an expected capital gains rate of 10%. The implied value of the accrual equivalent tax rate, however, is relatively robust to this assumption.

20 Approximately 22% of the common stocks and 0% of the preferred stocks are interlisted.

21 Unfortunately, we are forced to rely on US estimates, as we are aware of no recent Canadian studies which provide the necessary elasticity estimates.

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