Taxes, valuation, and organizational structure

by

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Abstract

This paper estimates the impact of taxes on firm value by taking advantage of a dramatic and completely unanticipated increase in taxes for a group of publicly-traded Canadian firms called income trusts. When the tax rate for income trusts unexpectedly increased from 0% to 31.5%, equity value fell by 21% and firm value fell by 18%, on average. Prospective tax shields mitigate the decline, adding 4.9% to firm value. Consistent with the presence of tax-based investor clienteles, the impact of the tax change depends on the marginal investor's personal tax status, which influences the value of tax shields. Therefore, simple estimates using the permanent debt approach in the Modigliani and Miller (1963) model substantially overstate the value the market places on tax shields. Finally, this dramatic change in tax policy provides new evidence on the significance of taxes for organizational form choices.

1. Introduction.

How valuable are tax shields? How much do personal taxes decrease the value of tax shields? And, to what extent do taxes affect firm value? These are central questions in corporate finance, yet surprisingly, there are few settled answers. Theory provides a range of predictions while the existing empirical evidence is mixed and sufficiently controversial that Fama (2010) argues that the big open challenge in corporate finance is to produce evidence on how taxes affect market values and thus optimal financing decisions. In this paper, we exploit a "quasi natural experiment" provided by an unanticipated and dramatic change in tax regime for a large number of publicly-traded firms. The changes in market values around this event provide new evidence on the relationship between taxes and firm value.

In the Modigliani and Miller (1963) setup, taxes reduce the value of an unlevered firm by the full corporate tax rate. A levered firm suffers a smaller loss when taxes are imposed because debt provides a tax shield worth $T_c \times D$ when the debt is permanent. Subsequent research that considers costs of debt finds that debt tax shields are less valuable. For example, Miller (1977) identifies conditions where the personal tax disadvantage of debt relative to equity eliminates the corporate tax benefit of debt. Allowing for non-taxable states of the world or non-debt tax shields also reduces the value of debt tax shields. Ultimately then, the value impact of taxes is an empirical issue. The empirical literature, discussed in more detail below, has produced a wide range of estimates, some of which are subject to non-tax explanations or identification challenges. To circumvent these problems, Graham (2003) calls for new research that uses market prices and exploits events where the tax interpretation is unambiguous. An obvious problem is that such events are rare.

Our paper responds to this call by taking advantage of an unexpected and significant change in tax policy that affected a large number of publicly-traded Canadian firms called income trusts. Prior to the tax change, firms that adopted the income trust structure could avoid paying almost all corporate taxes while retaining the advantages of the corporate structure. The trust structure, which arguably had no non-tax rationale (Edgar (2004)), allowed trusts to pass all income through to investors who were then taxed at the personal level. In the early 2000's, the Canadian equity market was transformed as trusts became an increasingly important part of the market. Established publicly-traded corporations from a broad cross section of industries converted to the trust structure and new firms entered public markets as trusts,

accounting for 70% of total IPO proceeds from 2001 to 2006. At its peak, the trust market was worth $285 billion (Canadian dollars), or 16% of the total market value of the Toronto Stock Exchange.[1]

The focus of our study is the market's response to the Canadian government's decision to eliminate the tax advantage of the income trust structure. After markets closed on October 31, 2006, the government announced the Tax Fairness Plan (TFP). The TFP eliminated the tax advantage of the income trust structure by imposing a tax rate equivalent to that levied on corporations, with a four-year phase in period for existing trusts. The plan to tax trusts broke a key election promise of the newly elected Conservative government and was a complete surprise to the market. *Reuters News* reported that "Canada stuns market with pledge to tax income trusts" while Canada's leading business newspaper, *The Globe and Mail* proclaimed "Ottawa's tax surprise sends investment bankers scrambling, investors fleeing, stock prices plunging."[2] This event came to be known as the "Halloween Massacre."

The stock market response to this tax change provides an excellent setting to analyze the impact of taxes on firm value. First, the TFP significantly increased trusts' tax rates (from 0% to 31.5%), but did not contain any other major reforms or information about trusts. We use changes in market values around this event and exploit variation in trusts' access to prospective tax shields to produce new market-based estimates of the value of tax shields. Importantly, these estimates do not require an accurate model of the full set of factors that might influence the costs and benefits of debt. Second, the tax structure encouraged trusts to pay large and regular distributions (similar to dividends), which encouraged investor clienteles based on personal taxes. For each trust, we construct a proxy for the personal tax status of the marginal investor prior to the TFP. We use this proxy to test whether personal taxes are priced and to estimate the impact of personal taxes on the value of tax shields. Third, because the TFP is a change in tax rates we can directly measure the net impact of an increase in corporate taxes on equity and firm value. Fourth, by examining flows into and out of the trust sector around the TFP we provide new evidence of the significance of taxes for organizational form choices. Finally, the Canadian tax system has enough similarities to that of the United States, e.g., a degree of double taxation of corporate income and higher personal taxes on interest compared to equity income, that our results should have broader significance.

[1] These figures include publicly-traded corporations that had announced plans to convert to the trust structure but had not yet completed the conversion.
[2] See *Reuters News*, October 31, 2006 and *The Globe and Mail*, November 1, 2006 page B1.

The abnormal returns of income trusts following the TFP announcement give an initial indication of the value impact of taxes. On average, equity value falls by 14% over the shortest meaningful event window (days 0 to 2) and by 19% over a longer window (days 0 to 10). The longer window allows for the initial uncertainty of the details of the tax change to be resolved and for market prices to more accurately reflect the full impact of the tax change.[3] The abnormal return for each trust captures the change in equity value. To compute the change in firm value (or value drop), we adjust each trust's abnormal return by its debt to value ratio. Firm value falls by 12% and 15% over these same windows. Regardless of the event window, the value drop is statistically and economically significant, but is always below the change in the statutory tax rate of 31.5%.

To estimate the value of prospective tax shields and to assess the impact of personal taxes, we estimate cross-sectional regressions that control for the phase in of the tax change (which goes into effect in 2011) and other firm characteristics. We predict that trusts with more prospective tax shields, measured as the median tax shield of firms in the same industry that are structured as corporations, should have a lower value drop. This is precisely what we find. Our estimates imply that prospective tax shields (debt plus non-debt) increase firm value by 4.9%.

If investors form clienteles based on their tax status, as suggested by Miller and Modigliani (1961) and many others (see Graham and Kumar (2006) and Desai and Jin (2010) for recent evidence), the impact of the TFP and the value of tax shields should depend on the tax status of the clienteles. Given the tax rules in Canada, low tax investors (particularly tax exempt and foreign investors) had the greatest tax savings from owning trusts and thus faced the greatest losses when the TFP removed the tax advantage of the trust structure. We use a proxy that arguably captures the tax status of the marginal investor, the ex-dividend drop ratio introduced by Elton and Gruber (1970), and test whether this measure captures different market responses to the TFP. We find that trusts with a lower tax clientele were indeed hurt more by the loss of the tax-advantage. For these trusts with low tax clienteles that were most affected by

[3] Because the TFP was announced after markets closed on October 31, Day 0 is November 1. The original press release provided an outline of the government's intention to tax income trusts but did not contain many details. Section 2 provides addition information about the TFP announcement.

the TFP, we also find that prospective tax shields are worth more. Prospective tax shields are worth 9% of firm value for trusts with a low tax clientele compared to 3% for trusts with a high tax clientele.[4]

Our setting allows us to directly estimate the full extent to which taxes impact firm value, after accounting for tax shields and personal taxes. The 31.5% increase in corporate taxes reduces equity value by 21% and firm value by 18%, on average. The existence of a gap between the corporate tax rate and the impact on value is consistent with Modigliani and Miller's (1963) prediction that tax shields mitigate the impact of taxes. The evidence is also consistent with Miller's (1977) argument that personal taxes matter, but our estimates suggest that his analysis overstates the extent to which they matter.

A potential concern with our results is that the tax change might have precipitated other changes in trust's actions that could also be priced. If some trusts made costly, inefficient decisions to access the tax benefits, the net benefit of the trust structure should have been lower for them. Therefore, the elimination of the tax benefit would have less impact on these trusts. To address this possibility we introduce a variety of measures to control for potential non-tax factors. With one exception, none of these factors is statistically significant. More importantly, they do not affect the statistical or economic significance of the coefficients on the tax variables, reinforcing our conclusions about the impact of taxes on firm value.

Finally, we explore some of the real consequences of the growth and then elimination of this tax-advantaged sector. Studies in the US typically find very limited responsiveness of organizational form decisions to taxes and conclude that non-tax factors appear to be dominant in the choice of organizational form (Mackie-Mason and Gordon (1997)). This may be because the tax effects examined in prior research are rarely significant enough or that their impacts are not clearly understood (Morck and Yeung (2005)). We find clear evidence of organizational responses to taxes. Prior to the TFP, the trust sector expanded rapidly through IPOs, SEOs, conversions, and acquisitions. By October 2006 it accounted for one sixth of market capitalization of the Toronto Stock Exchange. Since then, the flow of funds into the sector has completely stopped and outflows have intensified. By 2011, only a few income trusts remained.

We estimate the value of tax shields, the magnitude of the personal tax penalty, and the overall impact of taxes on firm value. Therefore, our paper is related to prior research that examines the relation between

[4] There is an extensive literature that debates the tax interpretation of the ex-day price drop. In Section 5.d, we discuss some alternative interpretations.

personal taxes and asset prices (e.g., Sialm (2009)) and to research that estimates the tax benefits of debt, summarized by Graham (2003) and Hanlon and Heitzman (2010). Cross-sectional studies provide estimates that vary from no value to debt (Fama and French (1998)), to debt tax shields having a value of 5.5% of firm value (Korteweg (2010)), to 10% of firm value so that there is almost no room for an impact of personal taxes (Kemsly and Nissim (2002)). Event studies that examine price reactions around changes in debt policy often find a significant value to debt (Masulis (1980)) but face an identification challenge to control for information effects that coincide with the tax event. Other event studies that are free from information effects are often limited to small samples that may not be representative (Engle, Erickson, and Maydew (1999)). Some of the more recent and influential estimates of the value of debt tax shields are based on accounting data and simulation methods. Graham (2000) estimates that debt tax shields are worth 9.7% of firm value while Van Binsbergen, Graham, and Yang (2010) find that they are worth 3.5% of asset value. Graham (2000) is one of the few papers that attempts to account for personal taxes. He finds that the value of debt tax shields is as low as 4% after personal taxes. Graham (2003) states the empirical magnitude of the personal tax penalty, and therefore the potential impact on the value of tax shields, is still an open question.

The remainder of this paper is organized as follows. In the next section, we provide some background information on income trusts. In Section 3, we describe our dataset and compare the characteristics of income trusts with corporates. In Section 4 we present the results of the event study and our estimation strategy. Section 5 provides estimates of the value of tax shields, the impact of personal taxes, and the overall impact of corporate taxes on firm value. In Section 6, we explore the organizational consequences of the tax policy surrounding income trusts. Section 7 concludes.

2. The Canadian income trust market and the Tax Fairness Plan.

The income trust structure was a classic form of tax arbitrage. It allowed the owners of a taxable firm to retain many of the non-tax advantages of the corporate form, namely, limited liability and access to public capital markets, while avoiding the negative tax consequences.[5] Although there were various forms

[5] Edgar (2004) argues that trusts are examples of tax-driven financial innovation that have no non-tax rationale. Amoako-Adu and Smith (2008) examine the valuation of income trusts and conclude that taxes are the main driving

of trusts, their key defining feature was that income earned was generally not subject to corporate income tax because trusts were treated as flow-through entities for tax purposes. Income earned by the trust flowed through to investors and was taxed as ordinary income at the personal level. In contrast, income earned by public corporations is taxed twice, once at the corporate level and once again at the shareholder level when income is distributed as dividends. Although a dividend tax credit allows taxable Canadian shareholders of to recover some of the corporate taxes that are paid, corporate and personal taxes are not fully integrated. The income trust structure eliminated the unintegrated portion of the corporate tax, which reduced the total amount of tax paid by investors.

In a typical trust structure, the trust sold units to investors and the proceeds were used to acquire all of the debt and equity of an operating corporation. The trust capitalized the operating corporation with non-arm's length private market debt ("internal" debt), which was long-term unsecured high-yield junk debt that was subordinated to any debt issued to third parties ("external" debt). The unit holders of the trust had a "stapled" claim to the returns from the internal debt and equity of the operating corporation. While most of their returns were in the form of interest, unit holders essentially owned an equity security because they were the residual claimants to the overall cash flow of the operating corporation. Therefore, the internal debt was in effect a tax-advantaged form of equity. Its purpose was to generate tax deductible interest payments that were sufficient to eliminate the operating corporation's income taxes so that income flowed to the trust tax-free.[6] If the trust distributed all of its taxable income to unit holders, no corporate tax was paid at the trust level (undistributed income was subject to tax). These expected trust distributions were announced in advance and paid in monthly or quarterly instalments. To fund growth, trusts could issue debt to third parties or sell more units.

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factor. In reference to trust conversation announcements by Telus and BCE, on November 2, 2006 Finance Minister Jim Flaherty stated, "We see them converting solely to avoid paying corporate taxes…." For further information on the history and institutional details of the income trust market see Hayward (2002), Aggarwal and Mintz (2004), Edgar (2004), and Halpern and Norli (2006). In Section 5.f we address some potential non-tax channels that could impact trusts' valuations and influence the interpretation of our results.

[6] In fact, trusts typically chose an internal debt level and interest rate so that all of the operating corporation's income was offset by interest payments. Hayward (2002) discusses the case of General Donalee Income Fund (a manufacturer of precision-machined products). The fund went public in 2002 and raised $77.8 million. The internal debt had a principal of $82.9 million with an interest rate of almost 16%. In general, third-party lenders ignored internal debt for the purposes of required debt-equity ratios in loan covenants.

Looking solely at statutory tax rates, it is clear that income generated by trusts faced fewer and lower taxes than income generated by corporations, but also that the tax gain from holding a trust depended on the investor's personal tax status. Unit holders paid personal taxes on income distributed by trusts. Tax exempt investors (e.g., investments held in individual investors' retirement accounts and pension funds) therefore faced a 0% tax on distributed income and foreign investors paid only a withholding tax, which for US investors amounted to 15%. Taxable investors paid taxes on this income at their marginal rate, which for the highest income investors was 46%.[7] These rates compared favorably with the implied tax rate on income distributed as dividends from regular corporations, where the 35% corporate tax rate plus personal and withholding taxes produced effective tax rates for tax exempt, foreign, and taxable individual investors of 35%, 45% and 49% respectively.[8]

Consistent with lower statutory taxes impacting firm choices, the number of firms organized as trusts grew steadily as publicly-traded firms converted to trusts, spun off part of their operations as trusts, or new firms became trusts through an IPO. Initially there were concerns that the trust structure did not provide unit holders with limited liability and trusts were primarily owned by retail investors. The issue of limited liability was resolved in 2004 and 2005 and institutional investor investment in the trust sector increased, which helped to create a powerful constituency to defend trusts' advantageous tax status.[9] This history helped create a diverse set of owners of trusts. In 2005, the Department of Finance estimated that

[7] Tax rates are from PriceWaterhouseCoopers (2006). They include federal and provincial taxes (for Ontario) and reflect an increase in the dividend tax credit introduced in 2005. The ultimate tax impact for foreign investors depended on whether or not they were a taxed entity in their home jurisdiction and the applicable tax rate. With a 35% corporate tax rate, $1 of pre-tax earnings for a Canadian corporation was worth $0.65 after taxes. If the corporation paid a $0.65 dividend, a US investor paid a 15% withholding tax of $0.10. Therefore, after all taxes were paid in Canada, $1 of pre-tax earnings was worth $0.55 to a US investor. An income trust paid no corporate tax so that $1 could be paid out. A US investor owed $0.15 in withholding tax so that $1 of pre-tax earnings was worth $0.85 after all taxes were paid in Canada. If the US investor was a non-taxed entity, no further tax was due in the US but the withholding tax could not be recovered. Taxable US investors could recover the withholding tax but owed personal taxes. Most trusts were treated as a foreign corporation for US federal income tax purposes – distributions were treated as dividends and were subject to the same tax rate as dividends paid by a Canadian corporation.

[8] The corporate tax rate of 35% was lowered in the spring of 2006. The TFP proposed to reduce it to 31.5% by 2011.

[9] The 2004 federal budget included a provision that limited pension fund ownership in business trusts. It was later withdrawn following opposition from institutional investors. In 2004 and 2005 the provinces of Ontario, Alberta, and Manitoba passed legislation that shielded trust investors from personal liability. Such legislation existed in Quebec since 1994. According to the TSX, at the end of 2005, 88% of Canadian income trusts were headquartered in these provinces. Using data from a private vendor (www.targeted.ca), we estimate that the average institutional ownership of income trusts in October 2006 was 34%.

in aggregate, 39% of trusts were owned by taxable Canadian investors, 39% by tax exempt investors, and 22% by foreign investors.

As of October 2006, the widely held view was that the tax-advantaged status of income trusts was here to stay, particularly with a newly elected Conservative government. A year earlier, on September 19, the governing Liberal party introduced a proposal designed to limit the growth of the trust sector, but following substantial opposition, announced on November 23 that trusts' preferred tax status would remain.[10] In early 2006, the government changed hands from the Liberals to the Conservatives. The Conservative party's election platform included a commitment to maintain the privileged tax status of the trust sector: "*A Conservative government will... Stop the Liberal attack on retirement savings and preserve income trusts by not imposing any new taxes on them"* (January 13, 2006). Following the election, the trust market grew significantly, with almost $70 billion worth of new trust conversion announcements, including two major telecommunications firms, Telus and BCE (worth $22 billion and $27 billion, respectively). Following the BCE announcement on October 11 of plans to convert to a trust structure, some market commentators wondered whether the government would be forced to review the trust structure. However, none expected any action in the immediate future, noting the high political costs.[11] Although we cannot entirely discount the possibility that the market anticipated an eventual end to trusts' special tax status, these concerns did not seem to be priced by the market. From November 23, when uncertainty about the Liberal government's trust policy was resolved, through October 31, 2006, returns in the trust market were similar to those of the overall Canadian market (16.2% vs. 15.5%). From the BCE announcement through the end of October, returns in the trust market were 6.2% compared to 6.6% for the overall market.

The event we focus on in this paper is the announcement of the Tax Fairness Plan on October 31, 2006 that effectively eliminated trusts' privileged tax status. The government explained that the TFP was a response to "the growing trend in tax avoidance" with the goal of "leveling the playing field between

[10] The government also announced a decrease in the effective dividend tax rate to narrow the tax gap between dividends paid by corporations and distributions paid by trusts.

[11] An analyst with Merrill Lynch wrote that he "doesn't expect the Conservative government to reopen the political Pandora's Box of income trusts' tax status any time soon…. The line in the sand for us with respect to when the government taxes trusts is 'when they need to' which for us does not happen until the fiscal surplus is less than $1 billion, or when the Conservatives lose power." Canada had a $13 billion budget surplus in 2005 and expected a surplus of $3.6 billion in 2006. See "BCE shares sag as investors worry over risk", *Reuters News*, October 12, 2006.

trusts and corporations" (see http://www.fin.gc.ca/n06/06-061_1-eng.asp). The key feature of the TFP was a new tax on distributions made by certain publicly-traded flow-through entities (defined as Specified Investment Flow-Through Entities, or SIFTs) including business trusts, royalty trusts, and limited partnerships, but excluding real estate investment trusts (REITs). The tax rate on trust distributions was equivalent to the rate paid by corporations and would begin in 2007 for all trusts that started trading after October 2006 and in 2011 for existing trusts so that for existing trusts there was a four-year phase in period. The distribution tax effectively ended the tax advantage for trusts over corporations.

The announcement, known as the "Halloween Massacre," completely surprised investors.[12] The newly elected Conservative government had explicitly promised not to tax income trusts and there was no policy discussion prior to the announcement. Government officials carefully monitored the trust market in the hours leading up to the announcement and were prepared to pull the announcement if there were any signs of unusual activity. However, nothing happened and the announcement went ahead as planned. The dramatic price drop for income trusts shown in Figure 1 (cumulative abnormal returns on a value-weighted portfolio of all trusts from September 26 through December 31, 2006), is consistent with the TFP being a surprise.[13]

3. The characteristics of income trusts.

To examine the impact of the TFP announcement on the value of income trusts, we first assemble a complete list of income trusts that traded on the Toronto Stock Exchange (TSX). In Section a we describe the sample and data sources. To understand how trusts compare with publicly-traded corporations that faced conventional taxes, we compare the characteristics of firms that organized themselves as trusts with those that chose the more typical corporate form in Sections b and c.

[12] See "Canada stuns market with pledge to tax income trusts", *Reuters News*, October 31, 2006; "Tories break key election promise on income trusts", *The Globe and Mail*, November 1, 2006; and "Income trust crackdown: The inside story", *The Globe and Mail*, November 2, 2006.

[13] Figure 1 also shows that the corporate sector was essentially unaffected. The value-weighted portfolio of corporates fell by -0.5% on November 1 and rose by 1.2% on November 2. In the following days, there were no significant changes in value.

a. The sample of income trusts and data sources.

We start with the complete list of income trusts available in the Datastream database but exclude 10 US-based trusts that were listed on the TSX via Income Participating Securities (IPSs) or Income Depositary Securities (IDCs) (see Halpern and Norli (2006)). Table 1, Panel a shows the growth of the trust market. In 1996 there were 16 trusts. By 2000, there were 47 trusts and by October 2006, there were 240. Of this total, 169 were from a wide variety of industries labeled as 'business trusts', 45 were energy trusts / pipelines, and 26 were REITs. In addition, there were five firms that had announced plans to convert to the trust structure but had not completed the conversion by October 2006 ("pending trusts"). Panel b shows the value of the trust market on October 31, 2006, just prior to the TFP announcement. In total, trusts were worth $195 billion and accounted for almost 11% of the total market capitalization of the TSX. Including pending trusts, these totals increase to $285 billion and 16%.

In our analysis, we require data on stock returns, market capitalization, trading volume (from Datastream), firm characteristics (from Compustat and Worldscope), and securities issuance and mergers and acquisitions (from SDC). Because the TFP was announced in 2006, we use firm characteristics from 2005. At the end of 2005, there were 213 trusts trading on the TSX, although we do not have complete data on firm characteristics for all of these trusts. All variables are defined in Table A1.

b. The industry distribution of income trusts and the characteristics of firms that converted to trusts.

Firms that wanted to be publicly-traded in Canada could choose between the corporate and trust structures. An obvious concern is that firms that chose to be trusts were systematically different, which would influence the interpretation our results. To address this issue we first compare the industry distribution of trusts with that of corporates. We then compare the characteristics of firms that chose to be trusts with corporates in the same industry.

Table 2, Panel a, compares the industry distribution of income trusts with that of corporates using the Fama-French 17 industry classification scheme. We require that all firms have at least $25 million in total assets at the end of 2005. Trusts are broadly represented across sectors and are present in 15 of 17 industries. Comparing the percentage of trusts and corporates in each industry reveals only a few notable differences, namely, that trusts are under-represented in the Mining and minerals industry and appear to be over-represented in the Banks, insurance companies, and other financials industry group (this is due to

REITs, which are assigned to this industry). A Kolmogorov-Smirnov test for the equality of distributions cannot reject the hypothesis that the distributions are the same.

We next analyze within industries whether firms that chose to become trusts are different from corporates. For IPOs, this analysis is not possible because of data constraints on pre-IPO data. We can, however, examine a smaller sample of publicly-traded firms that converted from the corporate structure to the trust structure. We are able to obtain data on firm characteristics in the year prior to conversion for 50 firms and compare their characteristics to those of firms that did not convert. The small sample size admittedly reduces the power of the tests, but the tests do provide some indication of whether firms that chose trust status were different. With the exception of total assets and market capitalization, firm characteristics are winsorized at the 1st and 99th percentiles.

In Table 2, Panel b we present firm characteristics for firms that converted to trusts (columns 1-2) at some point between 1996 and 2006 and then test for differences between converting firms and an industry-size matched reference group.[14] Compared to the matched firms (columns 3 and 4), there is little evidence of significant differences. In addition to the expected lack of difference in size due to matching ("Total assets" and "Market capitalization"), we find no significant differences in profitability ("ROA"), growth opportunities ("Tobin's Q"), cash flow, investment, leverage, non-debt tax shields, or tax rates. There is weak evidence that converting firms have lower cash holdings ("Cash/Net assets") and higher dividend yields. In both cases the means are significantly different at the 10% level but the medians are not significantly different. With the caveat that the sample includes 50 observations, the results in Panel b suggest that firms that chose the trust structure were not fundamentally different from those that did not. Therefore, the results we find for income trusts should potentially have broader applicability.

c. The characteristics of income trusts compared to corporates.

After a firm becomes a trust, we expect it to differ from corporates along a number of dimensions. Most obviously, we expect that trusts have lower tax rates as well as lower cash holdings and higher dividend (distribution) yields because undistributed income at the trust level is taxable. Because trusts have a tax incentive to pay out cash rather than leave it in the firm for future investment, they may invest

[14] To identify matching firms, we identify the firm in the same industry that did not convert to a trust and is closest in size based on total assets in the year prior to conversion. The smallest converting firm in our sample has total assets of $25 million so we require that all matching firms also have at least $25 million in assets.

less. The trust structure shields firms from substantially all corporate taxes and trusts do not need (external) debt or non-debt tax shields to lower their taxes. Therefore, trusts would not choose their leverage or make other decisions for tax reasons. After controlling for industry effects, there are no clear predictions for (pre-tax) profitability, growth opportunities, or cash flow.

To examine whether trusts are different along these dimensions, we turn to a different sample and empirical approach in Table 3. In this table, we estimate logit regressions, where the dependent variable equals one for trusts and zero for corporates. The sample includes all trusts and corporates with complete data on firm characteristics at the end of 2005 (164 trusts and 515 corporates). In models (1) to (9), we include each firm characteristic one at a time, along with the log of assets to control for size, and industry dummies (not reported). Trusts have lower cash holdings, investment, non-debt tax shields, and tax rates and higher cash flow and dividend yields. Dividend yields and tax rates provide the most explanatory power, with Pseudo R^2's of 54% and 36%, respectively. ROA, Tobin's Q, and leverage have positive coefficients, but are not significant. In models (10) and (11) we include all the variables together, excluding cash flow in model (10) and ROA in model (11), and arrive at similar results (we do not include ROA and cash flow in the same regression because the correlation between the two variables is 0.81). The main differences are that the coefficient on Tobin's Q is now significant and the coefficient on cash flow is insignificant. Firm size has a negative coefficient, but is significant in only three regressions and is not significant in models (10) and (11) when we include all of the variables together.

To summarize, the results in Table 2 suggest that prior to conversion, converting firms were not systematically different. However, when we compare trusts to corporates in Table 3, we find that trusts were different along several dimensions. In particular, they have lower tax rates, which is consistent with trusts being tax driven structures. There is also evidence of other differences, most notably significantly lower levels of investment. If trusts invested below efficient levels to access the tax benefits, their investment policy may also change following the TFP. We address this issue in Section 5.f where we consider non-tax changes that may have coincided with the change in tax policy.

4. The market's reaction to the Tax Fairness Plan.

In this section, we provide additional details about the TFP, discuss the details of the event study, and present the results.

a. Initial uncertainty surrounding the Tax Fairness Plan.

The TFP was announced after markets closed on October 31. In addition to completely surprising the market (see Section 2), the TFP introduced significant uncertainty that took several days to be resolved. The actual TFP press release is brief and does not provide many details other than to state that a tax would be imposed on trust distributions, with a four-year phase in for existing trusts (see http://www.fin.gc.ca/n06/06-061_1-eng.asp). As one analyst stated, "Markets can handle good news, bad news, but they can't handle not knowing what the news is, and the government's paper was relatively short and lacking a number of details."[15] Consistent with this concern, the initial sell off in the trust sector was to some extent indiscriminate. For example, REITs fell by almost 4% on November 1 and 2 even though they were exempt from the TFP. These losses were reversed on November 3 and 6. Much of the sell off on November 2 was concentrated in the energy trust sector, where US investors had substantial holdings and did not react immediately to the news on November 1.[16]

The uncertainty extended for several more days. The announcement of the TFP was a proposal, but had not been introduced or passed by parliament, where the Conservative party had a minority government. Aggressive lobbying by interest groups, including many who were large contributors to the Conservative party, to water down the proposal added to the uncertainty. The government made statements on November 3 and 5 that began to reduce the uncertainty. The Finance Minister confirmed that pending trusts would not be granted any exemptions and that there would be not be any changes or exceptions to the new rules. On the evening of November 7, parliament passed a motion that would allow the government to tax income trusts. The government also stated that the new rules would be changed if any new structures emerged that were clearly designed to frustrate their policy objectives.

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[15] See "Income trust shock waves sink Toronto stocks", *Reuters News*, November 1, 2006.

[16] Another analyst stated, "There are too many uncertainties right now. I see continued volatility until we get more clarity. Flaherty's 'tax fairness' plan is still a proposal, not legislation, which is one point of uncertainty.... We believe the full extent of the changes has not been well-disseminated to US retail investors, and trusts with high US ownership are likely to continue to come under pressure in the coming days." See "Market plunges following new trust tax proposal", *Daily Oil Bulletin*, November 2, 2006.

These facts suggest that we need to use an event window that allows the impact of the TFP to be fully priced by the market. At a minimum, we need to allow the initial uncertainty about the details of the TFP to be resolved, but ideally, we need a longer window that captures the policy uncertainty and volatility in the market. In the next section we discuss the abnormal trading volume model we use to help us identify the relevant event window.

b. Abnormal trading volume around the TFP announcement.

Given the initial uncertainty surrounding the details of the TFP, we use a model of abnormal trading volume to identify an event window to focus on in our analysis (see Meulbroek (1992)). Specifically, we estimate the following regression over the period from July 1, 2005 to December 31, 2006:

$$\ln(1 + v_{it}) = \alpha_i + \lambda_i \times \ln(1 + v_{it-1}) + \beta_i \times \ln(1 + v_{mt}) + \boldsymbol{\eta_i'} \times \mathbf{Weekday} + \boldsymbol{\delta_i'} \times \mathbf{Event} + \varepsilon_{it}, \qquad (1)$$

where v_{it} is trust i's trading volume on day t, v_{mt} is the total volume of all non-trusts on day t, **Weekday** is a vector that includes day of the week dummies, and **Event** is a vector that includes dummy variables for each event day from -5 to +15. Because all firms have the same event date, cross-correlations can bias the *t*-statistics upwards. Therefore, we estimate the regression for each trust as a system of equations using a seemingly unrelated regression (SUR) (see Schipper and Thompson (1983)). As noted earlier, there are 213 trusts at the end of 2005. The SUR framework requires complete data for each trust over the sample period. Therefore, we can only use trusts that existed prior to July 1, 2005. We lose 16 trusts that do not have data prior to this date. We drop another six trusts because we require that trusts trade on at least 90% of the trading days during the period. Finally, we exclude 20 trusts that do not have complete data all on variables used later in the cross-sectional regressions. This leaves a final sample of 171 trusts, including three pending trusts and 22 REITs. We estimate abnormal volume for REITs separately because they were excluded from the TFP, although this exclusion was not initially clear.

The estimates of δ_i measure each trust's abnormal volume on a given event day. Consistent with the TFP being a complete surprise, the first two columns in Table 4, Panel a show that there is no abnormal volume in the trust sector prior to Day 0 (November 1). Beginning on Day 0, the average value of the estimated δ_i's is positive and significant for each event date through Day 10 (with the exception of Day 4). After Day 10, it is no longer significant. Therefore, we focus on the "0,10" window (November 1 – 15) in our analysis, although for robustness, we also report and discuss results that use alternate windows

in Section 5.g. The last two columns show that there was abnormal volume in the REIT sector on Days 0, 1, and 2, but not on subsequent days.

c. The value drop following the TFP announcement.

We first estimate abnormal returns around the TFP announcement for each trust using the following regression model over the period from July 1, 2005 to December 31, 2006:

$$R_{i,t} = \alpha_i + \beta_i \times R_{b,t} + \gamma_i \times \text{Event} + \varepsilon_{it}, \quad (2)$$

where R_i is the daily return for trust i, R_b is the value-weighted return on the benchmark portfolio, and Event is a dummy variable that equals one on the event days following the TFP announcement. The benchmark portfolio includes all corporates (excludes all trusts and pending trusts) that have total assets of at least $10 million and trade on at least 40% of the trading days in a given year. The regression is estimated for each trust as a system of equations using SUR to account for cross-correlations in trusts' stock returns. The estimate γ_i measures each trust's average abnormal return over the event period (see Binder (1985)). To compute the cumulative abnormal return (CAR), each γ_i is multiplied by the number of days in the event period.

The CAR for each trust measures the change in the market value of equity. Theoretical work on taxes and value focuses on firm (enterprise) value. To compute the change in firm value ("Value drop"), the CAR for each trust is multiplied by 1 – D/V, where D/V is the trust's (external) debt to value ratio. As is standard, this calculation assumes that debt betas are zero. To compute the D/V ratio, we use the market value of equity at the close of trading on October 31, 2006 and the book value of debt at the end of 2005 (the most recent fiscal year end prior to the TFP announcement).[17]

Table 4, Panel b, reports the average CAR and value drop for trusts and REITs, along with the associated *t*-statistics, for various event windows. The price reactions for trusts are significant at the 1% level over all windows. By Day 10, prices stabilized and the trust sector had lost 15.28% in value (18.56% by equity value). Instead of valuing trusts as tax-free entities, the market now valued them as corporations with a four-year tax holiday. The market response for REITs is significant over the (0,1)

[17] Suppose that on October 31 E_0 = $100, D_0 = $50, and V_0 = $150. If the CAR following the TFP is -15%, E_1 = $85, D_1 = $50, and V_1 = $135. The value drop is (135 – 150) / 150, or -10%, which equals -15% × (1 – 50/150). E_1 is computed based on the CAR and not the actual, or raw return over the event period. We prefer to use the CAR to compute E_1 to account for market movements unrelated to the TFP that may affect trust returns over the event window. In the Section 5.g, we discuss the results of robustness tests that use the actual or raw return.

window but is insignificant over the (0,2) and subsequent windows. Consistent with the abnormal volume estimates in Panel a, the price reactions for REITs suggest that the (0,2) window is the shortest reasonable window to examine. Over that window, the trust sector lost 11.55% in value (14.07% by equity value).

Regardless of the event window, the value drop is significant, but is, on average, less than the statutory tax rate of 31.5%. To account for the phase in period of the tax change, as well as to explore the impact of prospective tax shields and personal taxes, we next estimate cross-sectional regressions.

5. The value of tax shields, personal tax clienteles, and the impact of taxes on firm value.

a. Benchmarks for the expected value of tax shields.

Before discussing our findings, we briefly review some benchmarks for the impact of the tax change on firm value. In Modigliani and Miller (1963), corporate taxes reduce value by the full amount of the tax rate if there are no tax shields. With tax deductible interest payments, debt tax shields mitigate the impact of the corporate tax and are worth $T_c \times D$, where T_c is the corporate tax rate and D is permanent debt. This is the upper bound for the value of debt tax shields. Miller (1977) introduces personal taxes and shows that debt tax shields are worth

$$\left[1 - \frac{(1 - T_c)(1 - T_e)}{(1 - T_p)}\right] \times D,$$

where T_e is the tax rate on equity income (a blended value based on the tax rates on dividends and capital gains), and T_p is the tax rate on personal income (e.g. interest income). When $(1 - T_p) = (1 - T_c)(1 - T_e)$, debt tax shields are worthless.[18] For a Canadian firm with a D/V ratio of 30% and a corporate tax rate of 31.5%, these models predict that tax shields are worth 9.5% of firm value if there are no personal taxes and between 3.7% and 5% of firm value for investors with high and low personal tax rates, respectively.[19]

The most influential empirical estimates of debt tax shields use accounting data and simulations (Graham (2000)). They are based on models that attempt to capture a wide range of the hypothesized benefits and costs of debt. This approach can, for example, capture the likelihood of non-profitable states

[18] The tax benefit of debt can also be less than $T_c \times D$ if firms do not have sufficient profits to take full advantage of debt tax shields, if bankruptcy or other costs of debt are considered, or if firms have access to tax shields other than debt (Kraus and Litzenberger (1973), DeAngelo and Masulis (1983), and Green and Hollifield (2003)).

[19] These calculations are based on personal tax rates for a high (low) tax investor with marginal tax rates of 46% (22%) on personal income and 31% (5%) on dividends.

of the world and firms' access to non-debt tax shields. A limitation is that it relies on an accurate underlying model and reliable inputs into simulations (Blouin, Core, and Guay (2010)). A particular challenge is accounting for the impact of personal taxes, given the difficulty of identifying the tax status of the marginal investor for each firm's debt and equity.

Our approach differs. We use market prices to provide a net estimate of the value of total tax shields. There are several advantages to our approach. First, it does not require an ex ante specification of the various benefits and costs of debt or the probability that a firm will be profitable in a given year. Second, we estimate the value of total tax shields. We use the combined value of prospective debt and non-debt tax shields because they are substitutes and jointly determined. Moreover, to estimate the overall impact of taxes on firm value, we need to know the value of total tax shields. Third, income trusts are well-suited to identifying the tax status of the marginal investor, which allows us to test whether personal taxes reduce the value of tax shields.

Our approach also has some disadvantages. The tax change is not immediate, but is phased in so we have to introduce a control variable to capture the phase in period. Because there was no tax-motivated reason for trusts to use debt at the time of the TFP, we use potential tax shields available in four years rather than current tax shields. In addition, we use the combined value of prospective debt and non-debt tax shields, rather than trying to isolate them separately, which make our experiment somewhat different from analyses that focus on debt tax shields.

b. The phase in of the tax change.

The fact that the tax change became effective four years following the TFP announcement should reduce the negative impact on firm value. It should also have a different impact on trusts depending on the percentage of value that is expected to be realized over the four year phase in period. In the extreme, a firm that has all of its value associated with cash flows expected during the phase in period would be unaffected by the tax change; similarly, a firm with all its value associated with cash flows more than four years out would be fully affected by the tax change. We introduce a control variable that captures the percentage of firm value associated with cash flows in the next four years ("% value in first 4 years"). We construct this variable using a simple valuation model. Specifically, we use the following equation:

$$\%\ \text{value in } 1^{st}\ 4\ \text{years} = \frac{\sum_{t=1}^{4} \frac{D_0(1+g)^t}{(1+K_e)^t}}{\text{Value}_{\text{Oct31}}}$$

Because trusts paid out substantially all of their earnings, we calculate the present value of distributions assuming they grow at market estimates. We base the earnings growth estimates on data from IBES and in the robustness section explore the implications of using historical growth rates as an alternative. The forecasted distributions are then discounted at industry discount rates, summed, and divided by the value of the trust on the day before the TFP announcement (see Table A1 for further details). We use discount rates based on same industry corporate betas under the assumption that these will be the relevant rates for trusts in the future. In later robustness checks, we use historical trust betas. Summary statistics for this variable and all other variables that we use in the regressions are provided in Table 5. The average (median) trust had 27.6% (26.2%) of its value coming from the first four years following the TFP.

c. The value of tax shields.

The trust structure provided a tax shield until it expired in January 2011. After that time, trusts could use debt and non-debt tax shields to lower their taxes. To capture prospective tax shields, we use the sum of debt and non-debt tax shields currently used by corporations in the same Fama-French 49 industry. For each industry, we calculate the median debt and non-debt tax shields for all Canadian corporations in the Compustat database for 2005 ("Industry tax shield"). This measure can be thought of as the tax shields trusts potentially have available in 2011. The average (median) value of this variable is 30.8% (33.1%).

We do not directly include a variable that captures a trust's current third-party debt or non-debt tax shields in the regressions. The reason is that the dependent variable, the value drop, is calculated by adjusting the CAR by 1 minus the D/V ratio. Therefore, the debt component of the firm tax shield variable would be mechanically related to the dependent variable. To investigate the potential importance of firm specific information, we create a dummy variable that equals one for trusts with tax shields below the industry median ("Low tax shield dummy"). Ex ante, it is unclear how much this variable should matter, even though it is firm specific information and could therefore capture some within-industry variation. The reason is that tax incentives would not matter to a trust when choosing its third-party debt

level, as long as it expected to remain a trust and the government continued to grant preferential tax treatment to trusts.

To estimate the value of tax shields, we estimate regressions where the value drop over the (0,10) window is the dependent variable. To ease interpretation of the results, it is multiplied by negative one, e.g., the average value drop is 0.1528. In the regressions, we require complete data on all firm characteristics, leaving us with a sample of 168 trusts and three pending trusts. Of these, 22 are REITs. Although REITs were excluded from the TFP, we include them in the regressions to ensure comparability of regressions that use value drops over longer and shorter windows (when REITs were priced). In later robustness checks, we verify that the results are not sensitive to including or excluding REITs. In all regressions we use heteroskedasticity-consistent standard errors to compute *t*-statistics.

Table 6 presents the results. In model (1) we introduce the industry tax shield along with control variables, the percentage of value in the first four years, a pending trust dummy, a REIT dummy, and the log of assets (measured at the end of 2005) to capture any effects due to differences in firm size. The coefficient estimate on the tax shield variable is -0.159 with a *t*-statistic of =-2.47, which indicates that tax shields mitigate the impact of the imposition of the tax. Model (2) adds the low tax shield dummy. The industry tax shield variable is still negative and significant while the coefficient on the dummy is positive and significant so that trusts with fewer prospective tax shields have a greater value drop. The adjusted R^2 increases from 32% in model (1) to 34% in model (2). The main control variables have the expected signs, though they are not always significant in these regressions. The coefficient on the percentage of value in the first four years is negative as expected, but is insignificant. The coefficient on the pending trust dummy (insignificant) and REIT dummy (significant) are both negative as expected. The coefficient on the log of assets is also negative, but is not significant. In subsequent regressions, the coefficients on the percentage of value in the first four years and the log of assets are significant.

The estimates in model (1) imply that a benchmark trust with mean prospective tax shields is worth 4.9% more compared to one with no prospective tax shields (-0.159 × 0.308 = -0.049). To produce this estimate, we consider a "benchmark trust" that is neither pending nor a REIT, is fully affected by the TFP (e.g., the impact of the four-year phase in period is removed by assuming that all value is due to cash flows generated in 2011 or later), but otherwise has mean characteristics. Similarly, the estimates in

model (2) imply that the value of tax shields ranges from 3.5% to 7.3%, depending on whether trusts have tax shields below or above the industry median (-0.237 × 0.308 + 0.038 × 1 = -0.035 and -0.237 × 0.308 + 0.038 × 0 = -0.073).

d. Personal tax clienteles and the value of tax shields.

In this section, we consider the presence of tax clienteles in the trust sector and examine whether differences in potential tax clienteles influenced the market's response to the TFP. As discussed earlier, given the tax treatment of trusts and corporates, there was a positive incentive based on statutory tax rates for trusts to be held by all types of investors. More importantly, for our purposes, the difference between effective tax rates for corporates and trusts was greatest for non-taxed entities and for foreigners. These incentives encouraged ownership of trusts by investors with heterogeneity in tax rates and create the possibility that the tax status of the marginal investor varied across trusts.

To identify the tax status of the marginal investor, we use the Elton and Gruber (1970) ex-dividend day drop ratio ("Ex-day drop ratio"), which uses a stock's price drop around its ex-day.[20] Elton and Gruber argue that differences in the magnitude of the ex-day price drop reveal differences in the tax status of the marginal investor. For example, a dollar of dividends is worth a dollar to a pension fund that pays no taxes on either dividends or capital gains. Therefore, for tax-exempt investors, the ex-day drop ratio (the price drop scaled by the amount of the dividend) should equal one. A dollar of dividends is worth less than a dollar to an individual who faces a higher tax rate on dividends than capital gains and the ex-day drop ratio should be less than one, i.e., personal taxes reduce the value of the dividend to the investor. According to this view, firms with marginal investors that have higher tax rates will have lower drop ratios.[21] In the Canadian trust setting, trusts pay distributions rather than dividends. Distributions consist

[20] An alternative is to use the percentage of shareholdings by shareholder type (e.g. institutional vs. retail investors) or use a dummy variable that identities the largest shareholder. We did not use these approaches because data on shareholder types is a not necessarily a good indicator of the tax status of the marginal investor (Chetty and Saez (2005) and Desai and Jin (2010)). Shareholders identified as institutional investors include those that hold taxable and non-taxable investments. A similar problem arises with using the percentage of holdings by retail investors.

[21] There is a substantial literature and numerous papers find evidence consistent with tax effects (Elton and Gruber (1970), Green and Rydqvist (1999), Graham, Michaely, and Roberts (2003), and Elton, Gruber, and Blake (2005) among others). However, there are at least two non-tax channels that can affect prices around the ex-day and potentially confound the tax interpretation. The first is short-term arbitrage trading around the ex-day (Kalay (1982)). Income trusts pay out a substantial amount of cash each year, but most do so via relatively small monthly payments. Given the small size of each payment, short-term trading is unlikely to be profitable after transaction costs. The second is related to microstructure arguments such as price discreteness and the bid-ask bounce (Bali and

primarily of interest income, which is taxed at the marginal rate for personal income rather than the rate at which dividends are taxed, which benefit from partial imputation. However, the personal tax rate is higher than the capital gains tax rate so that the same logic applies. Given the tax rates at the time, a trust with a high tax marginal investor has a predicted drop ratio of 0.70.[22]

For each trust, we compute the median ex-day drop ratio from January 2005 to October 2006, a period sufficiently long to produce multiple observations for each trust. We focus on the median response because the monthly distributions are relatively small and price responses can be swamped by noise due to ordinary volatility (see Table A1 for further details). Consistent with the hypothesis that trusts that make the largest dividend (distribution) payments are more attractive to investors with lower marginal tax rates (e.g., those with higher drop ratios), like Elton and Gruber, we find that the distribution yield is highly significant in explaining the drop ratio (not reported). When we divide trusts into quartiles based on distribution yields, there is a monotonic increase in the relationship between distribution yields and drop ratios. We find similar results using regression analysis. The coefficient on the distribution yield is positive and significant with and without controls for size, REIT status, and pending trust status. Elayan, Li, Donnelly, and Young (2008) and Klassen and Mescall (2006) also present evidence of clienteles based on personal tax status within the trust sector and between the trust and corporate sectors.

We winsorize the ex-day drop ratio at the 5th and 95th percentiles given that there are some extreme values in the raw measure. The mean (median) value is 0.67 (0.68) although there is substantial variation. We also use a discretized version of the drop ratio that captures cross-sectional variation in drop ratios, without relying on specific values. To identify firms with low tax marginal investors (high drop ratios), we create a dummy variable "Low tax investor dummy" that equals one for trusts with drop ratios above the 75th percentile. We set the cutoff at the 75th percentile to ensure that we identify the group of lowest tax investors with the dummy. If we do not winsorize the drop ratio or if we use the median value instead

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Hite (1998) and Frank and Jagannathan (1998)). More recently, Graham, Michaely, and Roberts (2003) exploit changes in tick sizes in US markets and do not find evidence consistent with these arguments.

[22] In 2006 an investor in Ontario in the highest tax bracket faced marginal tax rates of 46% and 23% on regular income and capital gains, respectively. In some periods, trusts include a return of capital with the distribution which is not taxed. As noted in Table A1, we exclude distributions that include a return of capital when computing drop ratios.

of the 75th percentile as the cutoff to create the dummy variable, the statistical significance of the results we discuss below is unchanged.

The tax interpretation of the ex-day drop ratio is debated in the literature. If this measure does not capture any cross-sectional variation in personal tax effects in our setting, there is no reason to expect it will be significant. If it captures tax effects, the regression coefficient should be positive and significant. In models (3) and (4) we add the ex-day drop ratio to models (1) and (2). As expected, the coefficient on the ex-day drop ratio is positive and significant in both models, indicating that personal taxes are priced. That is, trusts with a lower tax marginal investor have greater value drops. Miller (1977) argues that personal taxes eliminate the value of debt tax shields. The estimates in models (3) and (4) provide some initial evidence. When the ex-day drop ratio is included in the regression, the tax shield variables remain statistically significant, but the value of prospective tax shields is lower than when we ignore personal taxes (e.g., 3.9% in model (3) compared to 4.9% in model (1)). These results suggest that personal taxes reduce, but do not eliminate, the value of tax shields.

To more formally evaluate the impact of the marginal investors' personal tax status on the value of tax shields we introduce an interaction variable comprised of our proxy for personal tax status, the ex-day drop ratio and the industry tax shield measure ("Ex-day drop ratio × industry tax shield"). The interaction tests whether tax shields are worth more if the marginal investor has a lower personal tax rate, e.g., trusts where the marginal investor is hurt more by the tax change. This is what we find in models (5) and (6). The coefficient on the industry tax shield interaction is negative and significant. The ex-day drop ratio continues to be statistically significant, but the industry tax shield measure becomes insignificant.

To assess the economic significance of the results, we replace the ex-day drop ratio with the low tax investor dummy in model (7). The coefficient on the dummy is 0.035 with a *t*-statistic of 2.48 so that a trust with a low tax marginal investor has a 3.5% greater value drop compared to a trust with a high tax marginal investor. In model (8) we add the interaction term, which has a negative and significant coefficient, as expected. The coefficients imply that the value of tax shields for a trust with a low tax marginal investor is 9% of firm value compared to 3% for a trust with a high tax marginal investor ($-0.196 \times 1 \times 0.308 - 0.098 \times 0.308 = -0.09$ and $-0.196 \times 0 \times 0.308 - 0.098 \times 0.308 = -0.03$). Overall, the evidence is consistent with Miller's (1977) contention that personal tax status is important for identifying

the value of tax shields, but it does not show that personal tax differences eliminate the importance of tax shields more generally.

e. The impact of taxes on firm value.

To put the results in context, we compare our estimates to a naïve analysis using the Modigliani and Miller (1963) model. Assuming a D/V ratio of 30% and a tax rate of 31.5%, their model produces a value of debt tax shields equal to 9.5% of firm value. Our market-based estimates take into account a variety of factors that likely lower this number (e.g., the possibility that firms cannot realize tax shields in all states of the world and non-tax costs associated with debt) and some that increase this number (e.g. our measure of tax shields includes debt and non-debt tax shields). We find that tax shields are worth 4.9% of firm value if we ignore personal taxes and 3.9% if we account for personal taxes. Our estimates imply that a naïve application of the Modigliani and Miller model overestimates the value of tax shields by 48% to 59%. To further benchmark our findings, we compare them to estimates in other papers. Graham (2000) finds that debt tax shields are worth 9.7% of firm value (27% less than $T_c \times D$ in his sample) when ignoring personal taxes and 4-7% when including the personal tax penalty associated with interest income (47% to 69% less than $T_c \times D$). Korteweg (2010) finds that the net benefit of debt is 5.5% of firm value and Van Binsbergen, Graham, and Yang (2010) estimate it is worth 3.5% of asset value, although neither estimate accounts for personal taxes.

Our results show that tax shields increase firm value and that the value of tax shields depends on personal taxes. Importantly, we can go one step further and estimate the overall impact of taxes on firm value. As discussed earlier, very few prior studies can examine this issue directly. For a benchmark trust with mean tax shields and a marginal investor in the mean tax bracket, the estimates in model (3) imply that taxes reduce firm value by 18%. This value ranges from 15% to 20% if we consider differences in firm level tax shields or differences in the tax status of the marginal investor. If we re-estimate model (3) using the CAR over the (0,10) window as the dependent variable instead of the value drop (not reported), the estimates imply that equity value falls by 21%. Therefore, the overall impact of taxes, net of tax shields and personal taxes, is significantly below the corporate tax rate of 31.5%.

f. Non-tax channels.

Although the TFP announcement provides an excellent setting to examine the relationship between taxes and firm value, there are some potential limitations and disadvantages. An important concern is that the TFP may have produced some price reactions that were not driven by the tax channel. For example, if the trust structure required, or led to, inefficient organizational choices to access the tax benefits, the market may have priced the removal of this inefficiency when the TFP was announced. To the extent that this inefficiency was common across all trusts, it would affect the magnitude of the value drop, but would not influence the cross sectional results. However, it might not have been common across all trusts. In this section, we address three potential mechanisms that may have emerged simultaneously with the tax announcement and produced a price impact unrelated to taxes, namely, more efficient investment decisions, improved governance, and changes in the likelihood of takeovers. We use model (5) of Table 6 as the baseline specification (the ex-day drop ratio is positive and significant, the interaction between the drop ratio and industry tax shields is negative and significant, while there is no significant result on the tax shield by itself) and add proxies for these variables to this model. The results are in Table 7.

Trusts have a tax incentive to distribute all earnings, and therefore, potentially underinvest. Table 3 shows that trusts invest less than corporates, which could indicate that trusts reduced investment below efficient levels. If trusts underinvested, the net benefits of the trust structure should have been lower and therefore, underinvesting trusts should have had a lower value drop following the TFP as they returned to an optimal investment policy. In model (1), we test this hypothesis by including a variable that captures the difference between the median investment of corporates in the same Fama-French 49 industry and a trust's investment ("Under investment"). This variable has the predicted positive coefficient, but is insignificant, and more importantly, the main tax variables are unaffected.

It is also possible that the governance of trusts was different from that of corporates, in which case the TFP announcement also signalled a change in governance. To assess differences in governance and whether such differences might explain part of the value drop, we use a governance score produced by *The Globe and Mail*, Canada's leading national newspaper. *The Globe and Mail* measured governance for 68 of the trusts in our sample and for 175 corporates and published the results on October 25, 2006. The survey included trusts and corporates that comprised Canada's benchmark S&P/TSX composite index at

the end September 2006. It was designed to measure best possible governance practices that have been identified not only by regulators, but also by major institutional investors. The governance scores range from 0 to 100 and are based on: 1) board composition, 2) shareholding and compensation, 3) shareholder rights, and 4) disclosure (see http://www.theglobeandmail.com/report-on-business/board-games/).

We first test whether trusts have different governance scores compared to corporates. Using the governance score as the dependent variable, and a dummy variable that equals one for trusts and zero for corporates as the right hand side variable, we find that trusts have significantly lower governance scores (not reported in the table). Corporates have an average score of 65.8 while trusts have an average score of 62.5. When we include the log of assets in the regression to control for firm size, the trust dummy becomes insignificant (coefficient of -0.70 with a *t*-statistic of 0.47) and the adjusted R^2 of the regression increases from 0.99% to 17%.[23] If we further control for industry effects, the coefficient on the trust dummy is 1.23 with a *t*-statistic of 0.64. These results show that the observed differences in governance scores are mainly due to differences in firm size and/or industry rather than trust vs. corporate status. To the extent that *The Globe and Mail* survey captures important elements of corporate governance, the results suggest that governance issues should not influence our tax interpretation of the results. We also directly test whether governance impacts the value drop for the sample of 64 trusts with governance scores and complete data on other firm characteristics. The results are reported in model (2). The governance score is insignificant. The qualitative results are the same for the key coefficients, with a positive coefficient on the drop ratio and a negative coefficient on the interaction between the drop ratio and the tax shield, but neither is significant, likely due to the smaller sample size. If we estimate the regression without the interaction term (not reported), the industry tax shield is negative and significant.

A third potential non-channel that could impact the value drop is an increased likelihood of takeovers. Because trusts' enjoyed preferential tax status, they traded at higher valuations than similar corporates, which made acquisitions by strategic buyers that were not organized as trusts more costly and private equity buyers could not offer superior tax savings as an incremental source of value.[24] If the elimination of trusts' preferential tax status increased the likelihood of a takeover, prices of trusts more likely to be

[23] In general, we do not find much evidence that trusts are smaller than non-trusts (see Table 3). However, in the sample of firms covered by *The Globe and Mail* survey, trusts are significantly smaller than corporates.
[24] See "Takeover proof trusts have a cost", *The Globe and Mail*, October 19, 2006.

acquired should rise, which would offset some of the negative impact of taxes. This was a real possibility. In fact, the business press highlighted the takeover angle on the first day after the TFP announcement, although it focused less on this issue as takeovers failed to materialize amidst claims that the remaining four-year tax holiday made takeovers too expensive.[25]

To examine the takeover channel we gathered data on the potential overhang of takeover activity that we expect to vary systematically across industries ("M&A activity"). To capture takeover activity we identify the level of industry takeover activity using US data (the value of acquisitions of US public firms in the same Fama-French 49 industry, scaled by the value of all US listed firms and averaged over 2003-2006.). We use US data for two reasons. First, it captures the fact that many potential acquirers were American firms. Second, the Canadian market is much smaller and in many industries there are a small number of observations, some of which include acquisitions of trusts which would skew the measure. In 7 models (3) and (4) we introduce this variable into our regression. In model (3) we use the shorter (0,2) window and in model (4) we use our standard (0,10) window. Consistent with expectations, we find that the takeover measure is negative and significant (at the 10% level) in the short window but that the significance disappears when we use the longer window. Over the (0,10) window, the coefficient is not statistically significant and the main results are unchanged. One interpretation of these results is that the market changed the weight it placed on expected takeovers relative to prospective tax shields over time.

Overall, we find little evidence that non-tax factors affected the value drop following the TFP although it is possible that our proxies do not adequately capture non-tax differences across trusts that were understood at the time and were priced by market participants. To address this possibility we look beyond the event window and create a "catch all" ex post proxy for non-tax factors. The idea is that if there were inefficiencies associated with accessing the tax benefits and if they differed across trusts, those trusts with the biggest inefficiencies would move more quickly to abandon the trust structure following the TFP. In short, the speed of abandonment of trust status should capture the relative importance of non-tax factors, whether it is underinvestment, weaker governance or some other non-tax factor.

[25] See "Trust wreck", *The Globe and Mail,* November 1, 2006. The first of eight major impacts of the TFP highlighted on the front page of the business section was "a host of companies become takeover targets as their shares plunge."

We collect data on the date on which trusts abandoned the trust status following the TFP. Specifically, we identify the year and month that a trust abandoned its trust status and calculate the number of months until a trust was acquired or converted to a corporate structure ("Months survived"). The maximum number of months is 50, e.g., for trusts that remained as trusts from November 2006 through then end of 2010. Because potential non-tax factors likely differ between acquisitions and conversions, we create a dummy variable to indicate if a trust was acquired between November 2006 and December 2010 ("Acquired dummy").

In the full sample, we find that the median trust retains the trust structure until the end of 2010. Among the 46 trusts that were acquired, the median trust was acquired 10 months after the TFP announcement. Among the remaining trusts, the median is 50 months and the mean is 44 months. These summary statistics suggest that non-tax factors were at least secondary to the tax benefit of retaining the trust structure for the full four-year phase in period. In model (5) we include the acquired dummy and the months survived variable in the regression. Neither variable is significant and the other results are similar.

g. Robustness tests.

In Table 8, we assess the robustness of our results. Model (1) reproduces the regression from model (5) of Table 6 to provide a benchmark. Recall that the coefficient estimates from this regression imply that taxes decrease firm value by 18%.

One concern is that our results could be driven by the length of event window that we use to estimate the value drop following the TFP announcement. We focus on the (0,10) window to account for the initial uncertainty in the market place and to allow the market to fully price the tax change. However, it is possible that the uncertainty was resolved earlier and we are simply adding noise to the regressions by using a longer window. To assess the impact of window length we re-estimated the regressions for each window between Day 0 and Day 10 (i.e., (0), (0,1), (0,2), …(0,10)). In the table, we report results for the (0,2) window, the shortest window that is meaningful to look at (model (2)) and for the (0,5) window, a medium length window that coincides with the actual passage of the trust legislation (model (3)).

With the exception of Day 0, the coefficient on the ex-day drop ratio is positive and significant over all windows. The interaction between the drop ratio and tax shields is not significant on Day 0 or the (0,2) window, but is significant over all other windows, as in model (1). In regressions without the interaction

(not reported), the coefficients on the ex-day drop ratio and industry tax shield have the correct sign and are significant over all windows, with the exception of Day 0. The coefficients for the (0,2) and (0,5) windows imply that taxes reduce firm value by 15% and 17%, respectively. The evidence on takeover activity provides one possible explanation for the lower impact of taxes over the (0,2) window. Another is that the impact of the tax change had not yet been fully priced because the initial uncertainty surrounding the details of the TFP had not yet been resolved.

A related concern is our choice of the dependent variable. To calculate the value drop following the TFP, we estimate a market model regression to account for general market movements unrelated to the TFP. In model (4), we use the value drop unadjusted for market movements as the dependent variable. The coefficients on the ex-day drop ratio and the interaction between the drop ratio and tax shields are significant but somewhat lower in magnitude than those in model (1). The estimates from this model imply that taxes reduce firm value by 16%.

Although the trust structure allowed trusts to potentially avoid paying all corporate taxes, not all trusts were able to reduce their tax bill all the way to zero. For example, the average tax rate of trusts in our sample is 2.3%, although the median trust does not pay tax. For trusts that pay some corporate taxes, the TFP may have had less of an impact. To assess whether or not a trust's tax rate affects our inferences, we include each trusts' tax rate in model (5). The coefficient is not significant and the coefficients on the other tax variables are unchanged.

Another concern is that we may have introduced noise by including REITs in the sample. As noted earlier, there was some initial confusion about whether REITs would be affected, although subsequently it became clear that they would not be. In model (6) we exclude REITs and drop the REIT dummy from the regression. The results are very similar to those in model (1). The main change is that the adjusted R^2 of the regression is substantially lower.

Finally, we address concerns about how we capture the four-year phase in period of the tax change. One concern is that we should have used different variables to compute the percentage of value in the first four years. In models (7) and (8) we show two alternative specifications. Instead of computing a discount rate based on the betas of corporates in the same industry, we compute a discount rate based on a trust's own beta (model (7)). We also replaced the IBES growth forecasts with growth forecasts based on the

trusts' two-year historical sales growth (model (8)). These changes have very little impact on the results. A related concern is that the percentage of value in the first four years is measured with error, which could cause the regression coefficients to be biased. The true values of this variable are unobservable, even to market participants, and we use the same information available to them to compute its value. Therefore, to a certain extent, the errors in variables problem should be mitigated (Kennedy (2003)). Nonetheless, in model (9), we attempt to address this issue by estimating an errors in variables regression. We assume that the measurement reliability of the percentage of value in the first four years is 0.75 so that 25% of the variation in the variable is assumed to be due to noise (OLS assumes reliability equals one).[26] The results are similar to those in model (1).

6. Organizational structure.

The significant value attached to the ability to avoid corporate taxes provides powerful incentives for firms to adopt this structure, regardless of the overall efficiency consequences for the economy. Interestingly, studies in the US show only limited responsiveness of organizational form choices to tax differences (Gordon and Mackie-Mason (1994), Mackie-Mason and Gordon (1997), and Goolsbee (1998); Goolsbee (2004) is an exception). Mackie-Mason and Gordon (1997) conclude that non-tax factors appear to be dominant in the choice of organizational form as most alternatives to the corporate form in the US do not simultaneously provide limited liability and a public market for trading shares.[27]

In our setting, the preferential tax status comes with both limited liability and the units trade in a public market. We find much more evidence of substantial organizational changes. Harberger (1962), and particularly dynamic extensions to this model by Auerbach (2006), provide a useful theoretical benchmark for the expected impact of eliminating the corporate income tax. With the introduction of the

[26] There are two points to note here. First, the choice of 0.75 is arbitrary. We also estimated a regression with reliability set to 0.5 and found similar results. Second, the model reports the R^2 rather than the adjusted R^2.

[27] In the US, S Corporations provide limited liability and are not taxed at the corporate level, but are generally not publicly-traded because the number and type of shareholders is limited (Mackie-Mason and Gordon (1997)). In the 1980's, more than 100 firms organized themselves as Master limited partnerships (MLPs), which offered partnership taxation, as well as limited liability and publicly-traded ownership shares. However, in 1987, changes to US tax law required that most MLPs be taxed as corporations and most MLPs have since disappeared (Ciccotello and Muscarella (2001)). Recently, Limited liability companies (LLC) have become popular. Generally, ownership interests in LLCs are not publicly-traded, but if they are, LLCs are usually classified as corporations for tax purposes (Cartano (2009)).

trust structure to eliminate taxes, owners of trusts should benefit from an immediate price appreciation. Adjustment costs imply that over time capital will flow into the non-taxed trust structure and out of the taxed corporate sector until the after-tax rates of return across sectors these are equalized. The elimination of the special tax status produces the opposite effect, with a dramatic and immediate reduction in values for trust holders, and with adjustment costs, a gradual outflow of capital from the trust to the corporate sector.

In Section 4, we document the capital market impact of the TFP. Figure 2 and Table 9 show the capital flows into and out of the trust sector around the TFP (excluding REITs). Figure 2 documents the relative importance of capital raising via equity markets for trusts and corporates. Up until the TFP, money flowed to the trust sector through IPOs and SEOs. For example, in the Canadian market, trusts accounted for 40% to 90% of IPOs (by value) and 15% to 54% of seasoned equity offerings (by value) from 2001 until the TFP announcement in 2006.[28] In Table 9, Panel a, we show conversions. Prior to the TFP, 57 firms converted from the corporate structure to the trust structure. Including pending trusts, the total value of these firms prior to conversion was about $110.7 billion. Following the TFP not one new trust was created, either through an IPO or conversion and trusts have accounted for an average of only 7% of proceeds raised in SEOs. Through December 2009, 36 trusts completed a conversion back to the corporate structure and another 19 announced their intention to do so. Prior to the conversion announcement, these trusts were worth $143.6 billion.

Finally, in Panel b, we show flows due to acquisition activity. From 1995 until the TFP announcement, takeovers of trusts were not very common. In total, 24 trusts worth $13.4 billion were acquired, but most trusts were acquired by other trusts (71% of the acquisitions and 86% of total value). Only seven trusts worth $2 billion were acquired by non-trusts (corporates and private firms). At the same time, trusts acquired 48 non-trusts worth $8.5 billion during the same period. Since the TFP through the end of 2009, 46 trusts worth $38.4 billion were acquired by non-trusts (corporates, private firms, and private equity), whereas trusts have acquired 26 non-trusts worth $4.6 billion.

[28] The evidence on the growing number of trusts and their increased size shows that the trust structure grew in popularity. But it is also true that not all firms adopted this structure. Conservatism of some boards to change their organizational form was gradually being overcome, particularly as other firms successfully converted or announced plans to convert. A second factor is that even within an industry, there is some variability of earnings and taking full advantage of the trust structure for tax purposes was easier with more predictable earnings.

Overall, at the end of 2009 trusts accounted for about 4% of the total market capitalization of the TSX compared to 16% in October 2006 prior to the TFP. By 2011, the trust market had almost entirely disappeared. Although the evidence in this section is descriptive it shows a dramatic and clear change in capital flows into and out of the trust sector around the TFP announcement, indicating that taxes impact firms' organizational choices.

7. Conclusions.

In this paper we examine the impact of taxes on firm value using a "quasi natural experiment" provided by an unanticipated and dramatic change in the tax regime that affected a large number of publicly-traded firms. This setting helps address some significant identification challenges in previous empirical work. We estimate the value of prospective tax shields and show that differences in personal taxes impact the value of tax shields. We also directly estimate the overall impact of taxes on firm value.

The Tax Fairness Plan eliminated a mechanism that allowed trusts to substantially avoid paying all corporate-level taxes. We find that on net, firm value fell by 18% and equity value fell by 21%. Both amounts are substantially below the corporate tax rate of 31.5%. We find that two important factors influence the extent of the decline. First, prospective tax shields mitigate the impact of the new tax and on average contribute 4.9% to firm value. Second, personal taxes reduce the average value of tax shields to 3.9% of firm value, consistent with Miller's (1977) claim that personal taxes reduce the value of tax shields, although not to zero as he suggests. We also document an interesting interaction between tax shields and investor tax clienteles. Tax shields are worth much more for firms that have a low tax investor clientele that is most hard hit by the tax. Overall, our estimates imply that approximating the tax shield using the permanent debt approach in the Modigliani and Miller (1963) model overstates the value the market places on tax shields by 48% to 59%.

Finally, we provide evidence of the real consequences of the growth and then elimination of this tax advantaged sector. We find evidence of clear responses of organizational form decisions to taxes.

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Table 1. The income trust market.
Panel a shows the number of income trusts each year that are in the Datastream database. We exclude 10 US-based trusts that were listed on the TSX via IPS or IDC securities. "Pending" refers to firms that announced plans to convert to the trust structure in 2006, but had not completed the conversion before the TFP announcement on October 31, 2006. Panel b shows the total market capitalization ($, millions) of the trust sector in comparison with the total market capitalization of the corporate sector on October 31, 2006.

Panel a. The income trust market, 1996 to 2006.

Year	All trusts	Business trusts	Energy trusts / pipelines	REITs
1996	16	7	5	4
1997	27	12	9	6
1998	40	17	13	10
1999	46	20	15	11
2000	47	21	15	11
2001	56	26	18	12
2002	98	60	22	16
2003	130	78	32	20
2004	161	101	37	23
2005	213	145	43	25
2006	240	169	45	26
Pending 2006	5	3	1	1

Panel b. The value of the income trust market on October 31, 2006.

	All trusts	All trusts ex REITs	Pending trusts	All trusts + pending	Corporates
Market capitalization	$194,574.7	$163,185.1	$90,034.2	$284,608.9	$1,537,603.5
% of total of market capitalization	10.7%	9.0%	4.9%	15.6%	84.4%

Table 2. Industry distribution of income trusts and the characteristics of converting firms.
Panel a compares the industry distribution of income trusts and corporates using the Fama-French 17 industry classification scheme. Panel b compares the characteristics of 50 firms that converted (or announced plans to convert) from the corporate structure to the trust structure. Characteristics in the year prior to conversion are compared to industry and size matched Canadian corporations that did not convert. Variables are defined in Table A1. Firms are required to have at least $25m in total assets in both panels. In Panel b, significance is based on a two-sample means test (mean) and a sign test (median). *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel a. Industry distribution of income trusts and corporates.

	Income trusts		Corporates	
Industry	Counts	% of total	Counts	% of total
Food	12	5.91%	22	3.46%
Mining and minerals	2	0.99%	70	11.01%
Oil and petroleum products	45	22.17%	124	19.50%
Textiles, apparel, and footware	1	0.49%	3	0.47%
Consumer durables	5	2.46%	16	2.52%
Chemicals	2	0.99%	6	0.94%
Drugs, soap, perfumes, and tobacco	1	0.49%	19	2.99%
Construction and construction materials	10	4.93%	25	3.93%
Steel works etc	2	0.99%	10	1.57%
Fabricated products	0	0.00%	5	0.79%
Machinery and business equipment	6	2.96%	38	5.97%
Automobiles	0	0.00%	10	1.57%
Transportation	14	6.90%	20	3.14%
Utilities	6	2.96%	16	2.52%
Retail stores	12	5.91%	23	3.62%
Banks, insurance companies, and other financials	47	23.15%	96	15.09%
Other	38	18.72%	133	20.91%
Total	203		636	

Table 2, continued.

Panel b. Pre-conversion characteristics of firms that convert to income trusts.

	Firms converting to income trusts		Industry and size matched corporates	
	Mean	Median	Mean	Median
Total assets	2494.303	238.579	1251.755	210.958
Market capitalization	2168.023	180.492	1096.094	195.018
ROA	0.184	0.163	0.147	0.119
Tobin's q	1.158	1.006	1.286	1.009
Cash/Net assets	0.056*	0.010	0.106	0.022
Cash flow	0.126	0.124	0.103	0.092
Dividend yield	0.014*	0.000	0.006	0.000
Investment	0.101	0.008	0.134	0.042
Leverage	0.284	0.236	0.236	0.213
Non-debt tax shields	0.136	0.125	0.116	0.087
Tax rate	0.159	0.157	0.166	0.161

Table 3. Characteristics of income trusts compared to corporates.

This table presents logit regressions that compare the characteristics of income trusts with Canadian corporations at the end of 2005. The dependent variable equals one for 164 trusts and zero for 515 corporates. Firms are required to have at least $25m in total assets and complete data on all characteristics. Industry dummies are included, but are not reported. Variables are defined in Table A1. The *t*-statistics are computed with robust standard errors. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Constant	-0.969***	-0.911**	0.223	-1.110***	-3.133***	-0.659**	-0.881***	-0.792**	-0.105	-2.103*	-2.114*
	(-2.73)	(-2.22)	(0.60)	(-3.20)	(-5.17)	(-2.02)	(-2.71)	(-2.40)	(-0.25)	(-1.72)	(-1.74)
ROA	0.767									0.247	
	(0.73)									(0.07)	
Tobin's q		0.013								1.087**	1.110*
		(0.10)								(2.16)	(1.90)
Cash/Net assets			-8.899***							-10.538**	-10.550**
			(-4.08)							(-2.20)	(-2.21)
Cash flow				2.208**							-0.088
				(2.13)							(-0.02)
Dividend yield					53.380***					44.034***	44.182***
					(5.46)					(4.06)	(3.88)
Investment						-7.179***				-3.988**	-3.997**
						(-4.50)				(-2.12)	(-2.19)
Leverage							0.541			-1.925	-1.949
							(1.18)			(-0.97)	(-1.12)
Non-debt tax shields								-3.693**		-10.430**	-10.277*
								(-2.22)		(-2.10)	(-1.82)
Tax rate									-21.267***	-18.859***	-18.800***
									(-10.45)	(-5.90)	(-6.47)
Log (Assets)	-0.076	-0.075	-0.142***	-0.067	-0.031	-0.125***	-0.097**	-0.049	0.000	0.125	0.125
	(-1.63)	(-1.56)	(-2.75)	(-1.42)	(-0.46)	(-2.65)	(-1.97)	(-1.03)	(0.00)	(0.89)	(0.89)
N	679	679	679	679	679	679	679	679	679	679	679
Pseudo R^2	0.0556	0.0548	0.1497	0.0612	0.5360	0.1225	0.0563	0.0614	0.3562	0.7221	0.7221

Table 4. Abnormal volume and price reactions around the Tax Fairness Plan announcement.
In Panel a, the regression $\ln(1 + v_{it}) = \alpha_i + \lambda_i \times \ln(1 + v_{it-1}) + \beta_i \times \ln(1 + v_{mt}) + \boldsymbol{\eta_i}' \times \textbf{Weekday} + \boldsymbol{\delta_i}' \times \textbf{Event} + \varepsilon_{it}$, is estimated for each trust. v_{it} is trust i's trading volume on day t, v_{mt} is the total volume of all corporates on day t, **Weekday** is a vector that includes day of the week dummies, and **Event** is a vector that includes dummy variables for event days -5 to + 15, where Day 0 is November 1. The table reports the mean of the estimated δ_i's (abnormal volume) and the associated *t*-statistics. In Panel b, the regression $R_{i,t} = \alpha_i + \beta_i \times R_{b,t} + \gamma_i \times \text{Event} + \varepsilon_{it}$, is estimated for each trust. R_i is the daily return for trust i and R_b is the value-weighted return on the benchmark portfolio that includes all corporates that have total assets of at least $10 million and trade on at least 40% of the trading days. Event is a dummy variable that equals 1 on days included in the event window. The 0,1 window includes November 1 and 2; the 0,2 window includes November 1, 2, and 3, etc. γ_i is the average abnormal return over the event window for each trust. The cumulative abnormal return (CAR) reported in the table equals the average value of the γ_i's over each event window, multiplied by the number of days in the event window. The value drop (change in firm value) equals CAR × (1 – D/V). The sample includes 149 income trusts (includes pending trusts) and 22 REITs. The models in Panels a and b are each estimated as a system of equations using SUR from July 1, 2005 – December 31, 2006 and are estimated separately for income trusts and REITs. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel a. Abnormal volume.

	Income trusts		REITs	
Event day	Abnormal volume	*t*-statistic	Abnormal volume	*t*-statistic
-5	0.1039	0.46	0.0799	0.24
-4	0.0383	0.17	0.0001	0.00
-3	-0.1612	-0.86	0.4332	1.28
-2	-0.0239	-0.10	0.2020	0.60
-1	-0.0868	-0.38	0.2310	0.68
0	1.6500***	7.25	1.3531***	4.01
1	1.0709***	4.71	0.6915**	2.05
2	0.8548***	3.76	0.6986**	2.07
3	0.4904**	2.15	0.4646	1.37
4	0.2733	1.20	0.1136	0.34
5	0.4502**	1.98	0.2551	0.76
6	0.4431**	1.96	0.4088	1.21
7	0.5805***	2.55	0.3723	1.10
8	0.4737**	2.08	0.2673	0.79
9	0.6232***	2.74	0.3260	0.97
10	0.5874***	2.58	0.3750	1.11
11	0.3904	1.60	0.4655	1.38
12	0.3524	1.55	0.4599	1.36
13	0.3125	1.37	0.6646	1.51
14	0.1658	0.73	0.2720	0.80
15	0.2550	1.12	0.3599	1.07

Table 4, continued.

Panel b. Abnormal changes in equity value and firm value.

	Income trusts		REITs	
Event day	CAR	Value drop	CAR	Value drop
Day 0	-0.1245***	-0.1018	-0.018	-0.0093
t-statistic	-7.05		-1.33	
0,1 window	-0.1744***	-0.1433	-0.0367**	-0.0194
t-statistic	-6.96		-1.98	
0,2 window	-0.1407***	-0.1155	-0.0229	-0.0120
t-statistic	-4.38		-0.96	
0,3 window	-0.1275***	-0.1040	-0.0021	-0.0007
t-statistic	-3.38		0.02	
0,4 window	-0.1355***	-0.1107	0.0049	0.0041
t-statistic	-3.19		0.28	
0,5 window	-0.1481***	-0.1224	0.0038	0.0036
t-statistic	-3.20		0.26	
0,6 window	-0.1630***	-0.1340	0.0036	0.0036
t-statistic	-3.26		0.27	
0,7 window	-0.1716***	-0.1402	0.0094	0.0066
t-statistic	-3.18		0.40	
0,8 window	-0.1917***	-0.1586	0.0039	0.0035
t-statistic	-3.36		0.23	
0,9 window	-0.2075***	-0.1702	0.0077	0.0056
t-statistic	-3.42		0.32	
0,10 window	-0.1856***	-0.1528	0.0111	0.0076
t-statistic	-2.89		0.41	

Table 5. Summary statistics.
This table presents summary statistics for the variables used in Tables 6 to 8. The sample includes trusts with complete data on characteristics at the end of 2005, with the exception of Governance. Variables are defined in Table A1.

	N	Mean	Median	Standard deviation	Dummy variables: # 0's	Dummy variables: # 1's
Acquired dummy	171	0.269	0.000	0.445	125	46
Ex-day drop ratio	171	0.673	0.682	0.391	.	.
Ex-day drop ratio × industry tax shield	171	0.195	0.177	0.130	.	.
Governance	64	63.641	64.000	10.307	.	.
Low tax investor dummy	171	0.257	0.000	0.501	127	44
Low tax investor dummy × industry tax shield	171	0.069	0.000	0.130	.	.
Industry tax shield	171	0.308	0.331	0.114	.	.
Log(assets)	171	6.192	6.231	1.254	.	.
Low tax shield dummy	171	0.485	0.000	0.501	88	83
M&A activity	171	0.014	0.011	0.014	.	.
Months survived	171	36.386	50.000	17.467	.	.
Pending trust dummy	171	0.018	0.000	0.132	168	3
REIT dummy	171	0.129	0.000	0.336	22	149
Tax rate	171	0.023	0.000	0.042	.	.
Under investment	171	-0.046	-0.015	0.121		
% value in 1st four years	171	0.276	0.262	0.134		

Table 6. The value of tax shields and the impact of personal tax clienteles.

This table presents cross-sectional regressions that examine the value of tax shields. The dependent variable is the value drop following the TFP announcement on October 31, 2006. It is computed over the (0,10) window and is multiplied by -1. Day 0 is November 1. The sample includes 171 trusts with complete data on characteristics at the end of 2005. Variables are defined in Table A1. *t*-statistics are computed with heteroskedasticity-consistent standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.288***	0.262***	0.291***	0.263***	0.246***	0.206***	0.312***	0.302***
	(4.64)	(4.21)	(4.93)	(4.48)	(4.09)	(3.48)	(5.14)	(5.08)
Ex-day drop ratio			0.051***	0.053***	0.142***	0.161***		
			(3.24)	(3.54)	(3.87)	(4.48)		
Low tax investor dummy							0.035**	0.091**
							(2.48)	(2.40)
Ex-day drop ratio × industry tax shield					-0.296***	-0.351***		
					(-2.83)	(-3.44)		
Low tax investor dummy × industry tax shield								-0.196*
								(-1.75)
Industry tax shield	-0.159**	-0.237***	-0.126**	-0.207***	0.048	-0.014	-0.145**	-0.098
	(-2.47)	(-3.45)	(-2.09)	(-3.20)	(0.57)	(-0.16)	(-2.34)	(-1.38)
Low tax shield dummy		0.038***		0.040***		0.047***		
		(2.74)		(2.96)		(3.52)		
% value in 1st four years	-0.088	-0.084	-0.104*	-0.100*	-0.106*	-0.102*	-0.104*	-0.113*
	(-1.37)	(-1.33)	(-1.71)	(-1.68)	(-1.78)	(-1.76)	(-1.72)	(-1.87)
Pending trust dummy	-0.030	-0.039	-0.031	-0.041	-0.004	-0.011	-0.019	-0.014
	(-0.92)	(-1.09)	(-0.96)	(-1.16)	(-0.12)	(-0.26)	(-0.59)	(-0.40)
REIT dummy	-0.150***	-0.129***	-0.142***	-0.121***	-0.137***	-0.110***	-0.145***	-0.145***
	(-10.84)	(-8.32)	(-10.16)	(-8.04)	(-9.52)	(-7.37)	(-10.16)	(-10.17)
Log(assets)	-0.010	-0.006	-0.017**	-0.013*	-0.020***	-0.015**	-0.016**	-0.016**
	(-1.53)	(-0.86)	(-2.41)	(-1.80)	(-2.70)	(-2.06)	(-2.20)	(-2.24)
N	171	171	171	171	171	171	171	171
Adjusted R^2	0.3246	0.3444	0.3545	0.3771	0.3735	0.4050	0.3426	0.3486

Table 7. Non-tax channels.

This table re-estimates variations of model (5) from Table 6 to assess potential non-tax explanations. The dependent variable is the value drop following the TFP announcement on October 31, 2006 and is multiplied by -1. In models (1), (2), (4), and (5), the value drop is computed over the (0,10) window, while it is computed over the (0,2) window in model (3). Day 0 is November 1. Models (1), (3), (4), and (5) include 171 trusts with complete data on characteristics at the end of 2005. Model (2) includes *The Globe and Mail* governance score for 64 trusts that were covered by their survey. All variables are defined in Table A1. *t*-statistics are computed with heteroskedasticity-consistent standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Constant	0.251***	0.312**	0.220***	0.254***	0.255***
	(4.08)	(2.39)	(5.07)	(4.23)	(4.09)
Under investment	0.081				
	(1.43)				
Governance		-0.000			
		(-0.10)			
M&A activity			-0.751*	-0.516	
			(-1.76)	(-0.51)	
Acquired dummy					-0.029
					(-1.30)
Months survived					-0.000
					(-0.49)
Ex-day drop ratio	0.132***	0.050	0.062**	0.141***	0.144***
	(3.53)	(0.85)	(2.20)	(3.82)	(3.84)
Ex-day drop ratio × industry tax shield	-0.266**	-0.078	-0.124	-0.294***	-0.302***
	(-2.50)	(-0.40)	(-1.48)	(-2.78)	(-2.82)
Industry tax shield	0.068	-0.206	-0.005	0.053	0.054
	(0.79)	(-1.19)	(-0.07)	(0.63)	(0.63)
% value in 1st four years	-0.110*	0.140	-0.126***	-0.109*	-0.085
	(-1.83)	(1.42)	(-3.13)	(-1.84)	(-1.42)
Pending trust dummy	0.000	0.024	-0.023	0.000	-0.019
	(0.01)	(0.39)	(-0.68)	(0.01)	(-0.43)
REIT dummy	-0.135***	-0.108***	-0.098***	-0.135***	-0.135***
	(-9.38)	(-4.00)	(-8.98)	(-8.81)	(-9.30)
Log(assets)	-0.022***	-0.020	-0.012**	-0.020***	-0.019***
	(-2.90)	(-1.42)	(-2.51)	(-2.76)	(-2.69)
N	171	64	171	171	171
Adjusted R^2	0.3768	0.5807	0.3541	0.3748	0.3745

Table 8. Robustness checks.

This table provides robustness checks for model (5) from Table 6, which is re-produced in this table in model (1). The dependent variable is the value drop following the TFP announcement on October 31, 2006 and is multiplied by -1. Models (2) and (3) use the (0,2) and (0,5) windows. All other models use the (0,10) window. Day 0 is November 1. Model (4) uses the value drop unadjusted for market movements. Model (5) adds trusts' tax rate. Model (6) excludes REITs and drops the REIT dummy. Model (7) uses trust betas instead of corporate industry betas to compute the % value in the 1st four years while model (8) uses historical growth rates rather than IBES earnings growth forecasts. Model (9) estimates an errors-in-variables regression where the reliability of the percentage of value in the first four years is assumed to be 0.75. It reports the R^2 rather than an adjusted R^2. All variables are defined in Table A1. *t*-statistics are computed with heteroskedasticity-consistent standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.246***	0.209***	0.189***	0.225***	0.244***	0.254***	0.238***	0.236***	0.297***
	(4.09)	(4.84)	(3.03)	(4.21)	(3.99)	(3.98)	(3.89)	(3.86)	(3.82)
Ex-day drop ratio	0.142***	0.063**	0.111***	0.110***	0.142***	0.143***	0.144***	0.143***	0.145***
	(3.87)	(2.33)	(3.30)	(3.56)	(3.91)	(3.89)	(3.87)	(3.86)	(3.56)
Ex-day drop ratio × industry tax shield	-0.296***	-0.125	-0.248***	-0.217**	-0.298***	-0.288***	-0.302***	-0.302***	-0.298**
	(-2.83)	(-1.59)	(-2.62)	(-2.45)	(-2.87)	(-2.65)	(-2.88)	(-2.87)	(-2.48)
Industry tax shield	0.048	-0.012	0.004	0.040	0.050	0.044	0.052	0.052	0.030
	(0.57)	(-0.18)	(0.05)	(0.56)	(0.59)	(0.51)	(0.61)	(0.62)	(0.31)
Tax rate					0.042				
					(0.26)				
% value in 1st four years	-0.106*	-0.122***	-0.054	-0.075	-0.105*	-0.109*	-0.091	-0.088	-0.181*
	(-1.78)	(-3.00)	(-1.08)	(-1.44)	(-1.73)	(-1.80)	(-1.53)	(-1.48)	(-1.90)
Pending trust dummy	-0.004	-0.030	-0.011	-0.004	-0.007	-0.002	-0.004	-0.004	-0.004
	(-0.12)	(-0.87)	(-0.35)	(-0.13)	(-0.17)	(-0.06)	(-0.10)	(-0.10)	(-0.07)
REIT dummy	-0.137***	-0.100***	-0.107***	-0.130***	-0.136***		-0.135***	-0.135***	-0.144***
	(-9.52)	(-9.25)	(-8.83)	(-10.22)	(-9.06)		(-9.53)	(-9.54)	(-6.68)
Log(assets)	-0.020***	-0.012**	-0.008	-0.018***	-0.019***	-0.021**	-0.019**	-0.019**	-0.023***
	(-2.70)	(-2.42)	(-1.37)	(-2.89)	(-2.68)	(-2.60)	(-2.57)	(-2.55)	(-3.05)
N	171	171	171	171	171	149	171	171	171
Adjusted R^2	0.3735	0.3344	0.3734	0.4039	0.3699	0.1030	0.3700	0.3695	0.4085

Table 9. Taxes and organizational form: Flows into and out of the trust structure.
Panel a shows the number and value of conversions from the corporate to trust structure and from the trust to corporate structure. Market values are in billions for the day prior to the conversion announcement date. Panel b shows the number and value of acquisitions involving trusts before and after the October 31, 2006 announcement. Value are of acquisitions is in billions. All data in Panel b is from SDC. REITs are excluded. Conversions and takeovers announced after December 31, 2009 are excluded.

Panel a. Conversions.	Pre TFP Jan 1995 – Oct 2006	Post TFP Nov 2006 – Dec 2009
Conversion of corporates to trusts		
All conversions: number	57	0
All conversions: value	$110.7	
Completed: number	53	0
Completed: value	$34.1	$0
Announced but not completed by Oct 31, 2006: number	4	0
Announced but not completed by Oct 31, 2006: value	$76.6	$0
Conversion of trusts to corporates		
All conversions: number	0	55
All conversions: value	$0	$143.6
Completed by Dec 31, 2009: number	0	36
Completed by Dec 31, 2009: value	$0	$99.4
Announced but not completed by Dec 31, 2009: number	0	19
Announced but not completed by Dec 31, 2009: value	$0	$44.2

Panel b. Takeovers.	Pre TFP Jan 1995 – Oct 2006	Post TFP Nov 2006 – Dec 2009
Acquisitions by trusts		
All acquisitions by trusts: number	65	38
All acquisitions by trusts: value	$20.0	$13.4
Other trusts acquired: number	17	13
Other trusts acquired: value	$11.5	$8.8
Non-trusts acquired: number	48	26
Non-trusts acquired: value	$8.5	$4.6
Trusts acquired		
All acquisitions of trusts: number	24	59
All acquisitions of trusts: value	$13.4	$47.2
Acquired by other trusts: number	17	13
Acquired by other trusts: value	$11.5	$8.8
Acquired by non-trusts: number	7	46
Acquired by non-trusts: value	$1.9	$38.4

Figure 1. Returns around the Tax Fairness Plan announcement.

This figure shows cumulative abnormal returns on portfolios of trusts and REITs from September 26 to December 29, 2006 (days -25 to +40 around the October 31 announcement). It also shows cumulative returns on a value-weighted portfolio of corporates. To compute abnormal returns, the regression $R_{p,t} = \alpha + \beta \times R_{b,t} + \boldsymbol{\gamma}' \times \textbf{Event} + \varepsilon_t$, is estimated from July 1, 2005 – December 31, 2006. **Event** is a vector that includes dummy variables for event days, where November 1, 2006 is Day 0. R_p is the daily return on a value-weighted portfolio that includes all trusts (includes pending trusts but excludes REITs) or on a value-weighted portfolio of REITs. R_b is the return on the value-weighted benchmark portfolio that includes all corporates that have total assets of at least $10 million and trade on at least 40% of the trading days in a given year.

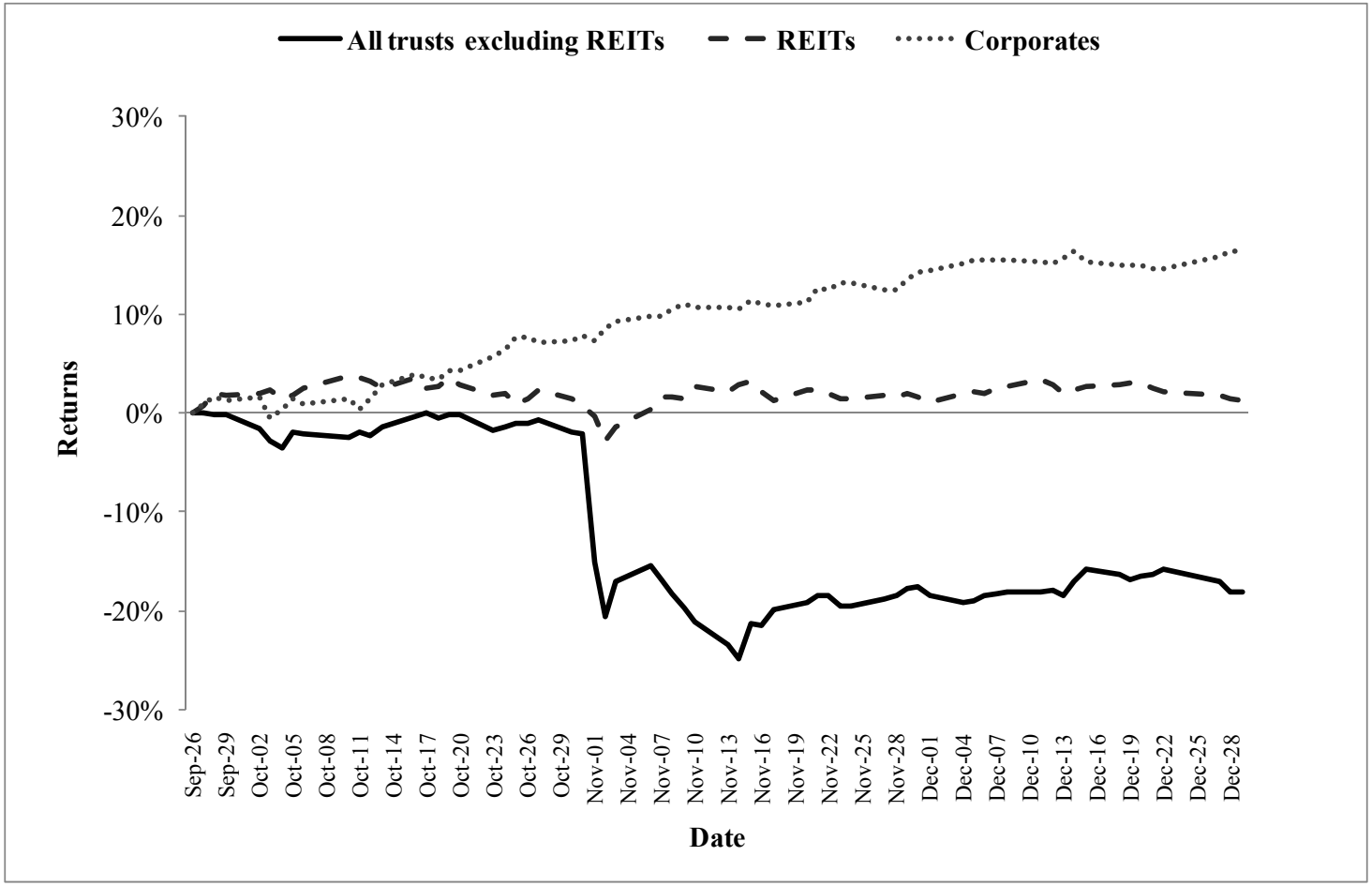

Figure 2. Capital flows to the income trust sector before and after the Tax Fairness Plan.
This figure shows the percentage of total proceeds from completed public equity issues (IPOs and SEOs) accounted for by income trusts. The sample includes all public equity issues in the Canadian market by Canadian firms (corporates and income trusts but excluding REITs) with total proceeds of at least $5million from 1999 – 2009.

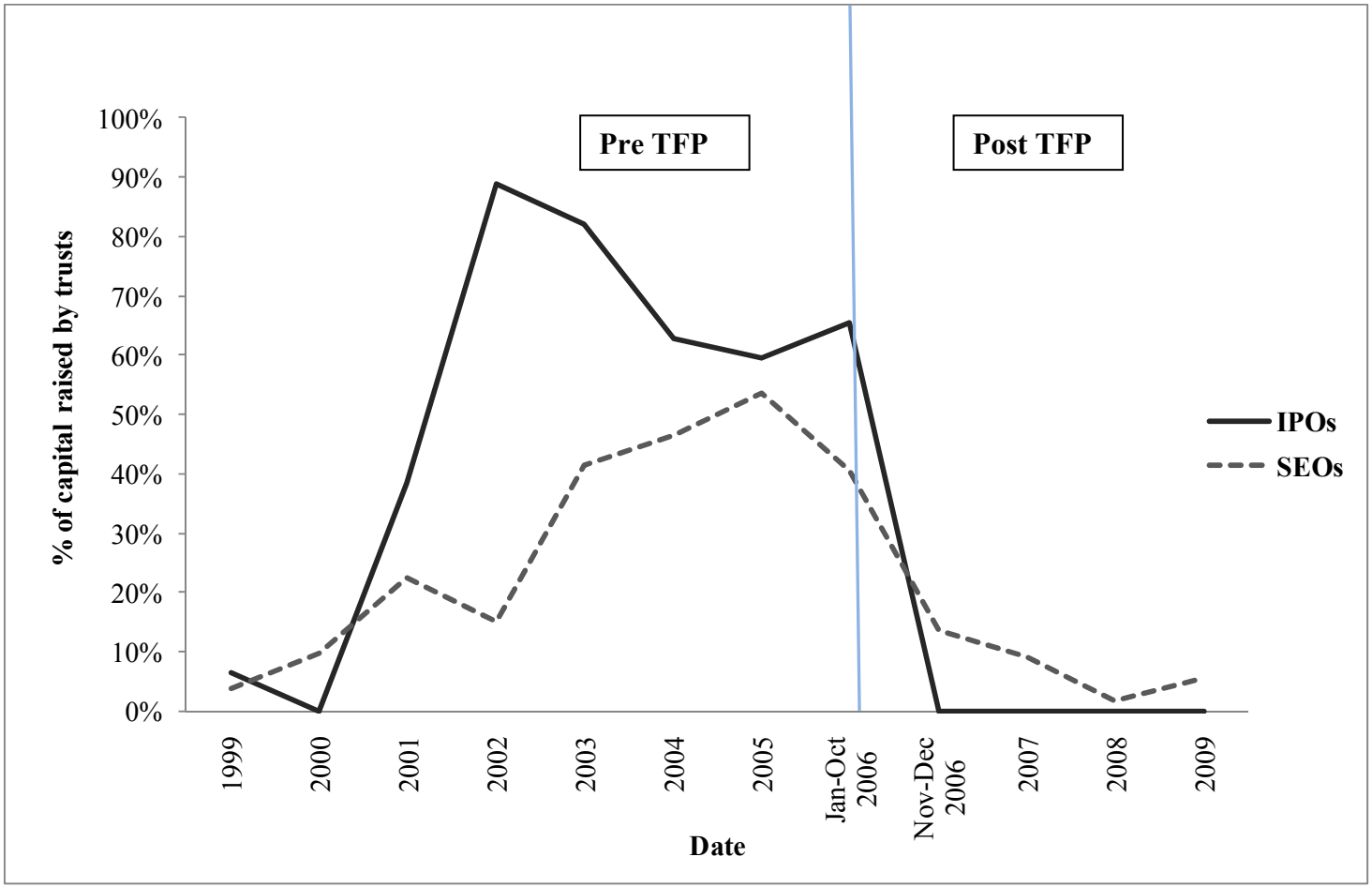

Table A1. Variable definitions.

All firm-level accounting data are from the Compustat and Worldscope databases. Stock return and volume data are from Datastream. M&A data is from SDC. With the exception of total assets and market capitalization, firm characteristics are winsorized at the 1% and 99% levels. Data is for 2005 unless stated otherwise.

Variable	Definition
Acquired dummy	Equals one for trusts that were acquired between November 1, 2006 and December 31, 2010.
Cash flow	(Income before extraordinary items + Depreciation) / Total assets, (Data18 + Data14) / Data6.
Cash / Net assets	(Cash + Short-term investments) / (Total assets – (Cash + Short-term investments)), Data1 / (Data6 – Data1).
Dividend yield	Dividends per share / Price at fiscal year close, Data26 / Data199. Trusts pay distributions rather than dividends.
Ex-day drop ratio	$\frac{P^b \times (1+ER) - P^{ex}}{D}$, where P^b is the price the day before the trust goes ex-dividend, ER is the trust's expected return (market return adjusted by the trust's beta), P^{ex} is the price on the day the trust goes ex-dividend, and D is the amount of the distribution. We calculate this ratio around all distribution payments from January 2005 to October 2006 for each trust and use its median drop ratio over this period. We only use dates when there was one distribution payment and we drop observations where the payment was not "regular cash," "special cash," or "partnership distribution". In particular, we drop distributions that include a return of capital. We also exclude observations when the distribution is so small (<$0.01) that the response will be swamped by noise and when the trading volume suggests other information is also released on that day (volume > mean plus 3 standard deviations). The drop ratio is winsorized at the 5th and 95th percentiles.
Governance	The Globe and Mail governance score measured at the end of September 2006. The governance scores range from 0 to 100 and is based on 1) board composition, 2) shareholding and compensation, 3) shareholder rights, and 4) disclosure.
Low tax investor dummy	Equals one for firms with ex-day drop ratios above the 75th percentile.
Low tax shield dummy	Equals one for trusts with tax shields below the industry median tax shield.
Industry tax shield	The median tax shield (includes debt and non-debt tax shields) of corporates in the same Fama-French 49 industry.
Investment	(Capital expenditures – Depreciation)/ Total assets, (Data128 – Data14) / Data6.
Leverage	(Short-term debt + Long-term debt) / (Total enterprise value), (Data34 + Data9) / (Market capitalization + Data34 + Data9).
M&A activity	The value of acquisitions of US public firms in the same Fama-French 49 industry, scaled by the value of all US public firms and averaged over 2003-2006.
Market capitalization	Price at fiscal year close × shares outstanding, Data 199 × Data25.

Table A1, continued.

Variable	Definition
Months survived	The number of months a trust remains as a trust following the TFP announcement through December 2010. Trusts that do not survive were either acquired or converted to a corporation.
Non-debt tax shields	(Depreciation + Investment credits) / Total enterprise value, (Data14 + Data35) / (Market capitalization + Data34 + Data9).
Pending trust dummy	Equals one for firms that announced plans to convert to a trust but had not completed the conversion by October 31, 2006.
REIT dummy	Equals one for real estate investment trusts.
ROA	Operating income before depreciation / Total assets, Data13 / Data6.
Tax rate	Average Income tax paid / Average Operating income before depreciation, computed as the average over the prior (up to) 5 years, Data16 / Data13.
Total assets	Compustat item Data 6.
Tobin's q	(Market capitalization + Total debt) / Total assets, (Data199 × Data25 + Data34 + Data9) / Data6
Under investment	Corporate industry investment – trust investment. Corporate investment is the median level of investment in the same Fama-French 49 industry.
Value drop	The change in firm value over the event window and is computed as the CAR × (1 – D/V), where the CAR equals the estimate of γ for each trust multiplied by the number days in event window. γ is the average abnormal return for each trust and is estimated from the regression $R_{i,t} = \alpha_i + \beta_i \times R_{b,t} + \gamma_i \times \text{Event} + \varepsilon_i$. The D/V ratio for each trust is measured on October 31, 2006.
% value in 1st 4 years	The ratio of the present value for the next four years, $\frac{D_0(1+g)^t}{(1+K_e)^t}$ to firm value on the day prior to the TFP announcement. For the distribution we use the annualized distribution (excluding special distributions and any return of capital) as of October 2006, IBES forecasts for growth (if not available we use historical growth rates), and the discount rate based on the beta for corporates in the same Fama-French 49 industry.