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Investor Taxes and Equity Pricing: Using Income Trusts in a Cross-Sectional Analysis

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PRÉCIS

À partir d'un modèle d'évaluation, les auteurs ont créé un modèle Feltham-Ohlson après impôt pour mieux comprendre l'incidence des impôts des investisseurs ainsi que des sociétés sur l'évaluation des capitaux propres. Ce modèle est appliqué à la situation unique des fiducies de revenu au Canada pour explorer l'effet des impôts ainsi que des caractéristiques fiscales des investisseurs sur l'évaluation. Les fiducies de revenu canadiennes sont des entités intermédiaires cotées en bourse dont l'utilisation va au-delà du secteur immobilier traditionnel. Leur statut fiscal unique et leur usage généralisé dans divers secteurs d'activité permettent d'évaluer le rôle des impôts des investisseurs sur les actions ordinaires dans le cadre d'une analyse transversale. Les essais empiriques révèlent que la valeur des bénéfices est moins élevée pour les sociétés que pour une série d'entreprises appariées exerçant leurs activités sous la forme d'une fiducie de revenu, ce qui est compatible avec la situation de l'investisseur moyen dans une fiducie de revenu, qui est imposée à un taux nettement inférieur au taux d'impôt marginal le plus élevé des particuliers.

ABSTRACT

Adapting a valuation model, the authors create an after-tax Feltham-Ohlson model to gain deeper insights into the effect of both investor- and corporate-level taxes on equity valuation. We apply this model to the unique Canadian setting of income trusts to explore the valuation effect of taxes and the tax characteristics of investors. Canadian income trusts are publicly traded flowthrough entities whose use expanded beyond the

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traditional real estate sector. Their unique tax status and broad usage across industries provides an opportunity to investigate the role of investor taxes on common shares in a cross-sectional analysis. Empirical testing shows that the value of earnings is lower for corporations than for a set of matched businesses operating as an income trust, consistent with the average investor in an income trust having a tax rate significantly below the top marginal individual rate.

KEYWORDS: VALUATION ■ EQUITY ■ TAXES ■ CORPORATE ■ INVESTORS ■ INCOME TRUSTS

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INTRODUCTION

To understand the effect of shareholder taxes on the firm's value, we develop a model of investor taxes and the valuation of corporations. The role of taxes on investments in equities has been a controversial area of research since the seminal work of Miller and Scholes.[1] Documenting the existence of shareholder tax effects on common share value in a cross-sectional setting has been difficult because there are generally no similar securities with differing tax treatment. To overcome this challenge, empirical studies of investor taxes have generally favoured using tax-law changes in time-series

1 Merton H. Miller and Myron S. Scholes, "Dividends and Taxes" (1978) 6:4 *Journal of Financial Economics* 333-64; and Merton H. Miller and Myron S. Scholes, "Dividends and Taxes: Empirical Evidence" (1982) 90:6 *Journal of Political Economy* 1118-41.

tests rather than cross-sectional tests, or using tax-law changes in conjunction with specialized securities and settings, as described more fully below. This article exploits the unique opportunity created by Canadian income trusts to provide new evidence consistent with the existence of investor tax effects on equity valuation in a cross-sectional setting. Additionally, we provide evidence that choice of organizational structure can be a value-creating decision when it creates asymmetric tax implications for the investors.

The income trust hybrid organizational structure grew dramatically in the Canadian equity market between 2001 and 2006. Unlike businesses operating in a corporate structure, income trusts do not pay corporate taxes but instead distribute their taxable income to the unitholders each year in a fully taxed form. While income trusts have been available for many years in the United States and Canada, particularly in the form of real estate investment trusts (REITs) and oil and gas royalty trusts, in Canada the trust structure is now used in many business sectors, including utilities, telecommunications, industrials, consumer products, and financial services.

We exploit these unique institutional features to explore the following two research questions:

- First, we address the extent to which differences in the taxation of organizational forms affect equity prices and, in particular, whether taxation affects the value of pre-tax earnings of corporations relative to income trusts. This is an important question for at least two reasons. If differences in taxation across organizational forms affect prices, then optimal portfolio choice will involve tax and risk characteristics of both the investor and the security. Within US markets, anecdotal evidence such as the market's favourable reaction to Weyerhauser's conversion to a REIT in 2010, or the successful campaign led by the Elliot Management Corporation hedge fund to force the conversion of Iron Mountain Inc.,[2] suggests that markets do perceive value in the difference of these tax characteristics. Meanwhile, as discussed below, in 2006 the Canadian government took steps to eliminate the tax benefits of the income trust structure by 2011. A fuller understanding of the pricing of this organizational form will aid policy makers in their ongoing debates over the effects of their policies on market prices.[3]
- Second, we consider what investor tax rate is implied by the market prices for investments in common equities versus investments in flowthrough entities. This is an important question because, as described by Shackelford and

2 See, for example, Ernest Scheyder, "Weyerhauser To Convert to REIT," *Reuters*, December 15, 2009; Amy Or, "In Push for REIT Plan, Elliott Nominates 4 to Iron Mountain Board," *Wall Street Journal*, March 10, 2011.

3 Barry Critchley, "The Return of Income Trusts," *Financial Post*, March 30, 2011, cites several trusts that have found new methods to preserve their former tax treatment as flowthrough entities, rather than being subject to the new entity tax.

Shevlin,[4] widely accepted theoretical models of valuation either explicitly or implicitly assume that investor-level taxes are zero.[5] If equity prices imply an investor tax rate reliably greater than zero, models of common equity valuation need to be reconsidered.

Prior literature has relied on event studies to explore the price effect of investor taxes.[6] These studies typically compare market reactions, across firms, to a change in either the dividend tax rate or the capital gains tax rate. While the literature provides reliable evidence, the event study method is innately susceptible to confounding events, and isolating the tax effect from other correlated characteristics or related market events associated with these tax-law changes is difficult.[7] Edwards and Shevlin[8] focus on the unexpected announcement of the new income trust tax regime in October 2006 to assess the value of the Canadian shareholder dividend tax credit. They demonstrate a significant decline in the price of income trusts, a result that is consistent with our findings. Other researchers, such as Dhaliwal et al.,[9] try to measure the effect of investor taxes by exploring macroeconomic changes over a long period of time, such as changes in the dividend tax rate. Dividend payments and institutional ownership are used as proxies for investor tax rates and preferences in the cross-section. However, Guenther and Sansing[10] challenge using the proportion of shares held by institutional investors as a cross-sectional proxy for the price-setting investor's tax rate. Our article differs from this literature in that

4 Douglas A. Shackelford and Terry Shevlin, "Empirical Tax Research in Accounting" (2001) 31:1-3 *Journal of Accounting and Economics* 321-87.

5 See, for example, James A. Ohlson, "Earnings, Book Values, and Dividends in Security Valuation" (1995) 11:2 *Contemporary Accounting Research* 661-87; and Miller and Scholes, "Dividends and Taxes," supra note 1.

6 For example, Merle Erickson and Edward Maydew, "Implicit Taxes in High Dividend Yield Stocks" (1998) 73:4 *The Accounting Review* 435-58; Benjamin C. Ayers, Bryan Cloyd, and John R. Robinson, "The Effect of Shareholder-Level Dividend Taxes on Stock Prices: Evidence from the Revenue Reconciliation Act of 1993" (2002) 77:4 *The Accounting Review* 933-47; Benjamin C. Ayers, Craig E. Lefanowitz, and John R. Robinson, "Shareholder Taxes in Acquisition Premiums: The Effect of Capital Gains Taxation" (2003) 58:6 *Journal of Finance* 2783-2801; Mark H. Lang and Douglas A. Shackelford, "Capitalization of Capital Gains Taxes: Evidence from Stock Price Reactions to the 1997 Rate Reduction" (2000) 76:1 *Journal of Public Economics* 69-85; Alexander Edwards and Terry Shevlin, "The Value of a Flow-Through Entity in an Integrated Corporate Tax System" (2011) 101:2 *Journal of Financial Economics* 473-91; and Zhonglan Dai, Edward Maydew, Douglas A. Shackelford, and Harold H. Zhang, "Capital Gains Taxes and Asset Prices: Capitalization or Lock-In?" (2008) 63:2 *Journal of Finance* 709-42.

7 See Ayers, Cloyd, and Robinson, supra note 6, at 945, for a discussion of this point.

8 Supra note 6.

9 Dan Dhaliwal, Linda Krull, Oliver Zhen Li, and William Moser, "Dividend Taxes and Implied Cost of Equity Capital" (2005) 43:5 *Journal of Accounting Research* 675-708.

10 David A. Guenther and Richard Sansing, "The Effect of Tax-Exempt Investors and Risk on Stock Ownership and Expected Returns" (2010) 85:3 *The Accounting Review* 849-75.

we consider two types of securities—corporate shares and units in an income trust—that differ in their tax treatment but are similar along other dimensions. With this cross-sectional setting, we are able to explicitly estimate the effect of taxes impounded in common equity because the combined entity and investor taxes across the two structures differ dramatically.

Using a valuation model, described below, we determine the theoretical effect of investor tax rates on the value of corporate shares relative to a flowthrough entity's equity. We combine elements of models described by Poterba and Summers,[11] Auerbach,[12] Ohlson,[13] and Feltham and Ohlson,[14] to create an after-tax Feltham-Ohlson model, and adapt this to a flowthrough organizational structure. Our model demonstrates that the coefficient on pre-tax earnings for corporations, relative to that on flowthrough organizations, will be increasing in investors' tax rates.

We apply this model to the Canadian income trust structure. Using a matched set of income trusts and corporations, the empirical tests reveal that the coefficient for regular corporations is 4.51, whereas the coefficient for income trusts is 7.12. While one should interpret point estimates with caution, these coefficients are consistent with the investors in this market having a weighted average tax rate of not more than 7 percent, a low rate in Canada.[15] Next, we segment the sample into energy and non-energy firms. Energy trusts were widely acknowledged to have high levels of foreign ownership, creating a relatively high investor tax rate. When interactions are included for energy firms, the pattern of coefficients in both sets of tests are consistent with a high investor tax rate for energy trusts and a low investor tax rate for other trusts.

This research contributes to our understanding of equity valuation in several important ways. Most importantly, through this powerful setting, we are able to provide robust evidence consistent with the existence of investor tax effects on equity valuation in a cross-sectional setting. Comparing the value of income trusts with that of corporations, corporations' values are lower, on average. We also document

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11 James M. Poterba and Lawrence H. Summers, "The Economic Effects of Dividend Taxation," in Edward I. Altman and Marti G. Subrahmanyam, eds., *Recent Advances in Corporate Finance* (Haywood, IL: Dow Jones-Irwin Publishing, 1985), 227-84.

12 Ohlson, supra note 5.

13 Alan J. Auerbach, "Taxation and Corporate Financial Policy," in Alan J. Auerbach and Martin Feldstein, eds., *Handbook of Public Economics*, vol. 3 (Amsterdam: Elsevier Science, 2002), 1251-92.

14 Gerald A. Feltham and James A. Ohlson, "Valuation and Clean Surplus Accounting for Operating and Financial Activities" (1995) 11:2 *Contemporary Accounting Research* 689-731.

15 Individual Canadian investors' tax rates range from 0 percent for investments through tax-deferred retirement accounts to as much as 49 percent. Foreign investors are subject to a 15 percent withholding tax and whatever net investor-country tax might apply. Assuming that the Canadian taxes are creditable, the estimate of 7 percent is low, but not too low to be consistent with a significant proportion of foreign investors (the perspective taken by Edwards and Shevlin, supra note 6). Taxable Canadian corporations rarely invest in income trusts because income from an income trust is taxed at regular corporate rates of approximately 36 percent, the same rate that applies to intercorporate investments.

differences across industries that are consistent with the investors' tax-rate differences. This direct empirical evidence of implicit taxes in common equity pricing corroborates evidence provided by event studies. Thus, our evidence contributes a new element to this extensive literature.

Additionally, the unique setting and the model provide insights into the investor's tax rate. This evidence is an important input into many valuation models that ignore investor tax rates. For the broad sample of income trusts, the estimated tax rate of the investors is approximately zero, consistent with the clientele for this structure in Canada. However, when the investors are believed to have a higher tax rate on average, owing to high foreign involvement, the relative valuation reflects this fact.

Lastly, our tests are the first to document reliably that being an income trust is value creating, a common assertion in the popular press.[16] With the continuing operation of flowthrough entities in Canada and the United States, our study also provides policy makers with new information on the role of tax policy in the equities market, and suggests the possible longer-run effects of various organizational tax regimes.[17] Additionally, alternative structures that are able to achieve similar tax characteristics have arisen in response to the government's efforts to eliminate income trusts.[18] Finally, the unique income trust structure provides a benchmark against which to study the effects of taxation on equity valuation, concepts that are broadly applicable to securities markets and may explain the favourable reception accorded to REIT conversions by certain hedge funds and the market in general.[19]

In the next section of the article, we develop a theoretical model of the value of the two organizational forms. We then describe the income trust structure in more detail. Next, we develop the hypotheses, specify the research design, and test the model. The last section of the article summarizes our conclusions.

EQUITY VALUATION MODEL

An After-Tax Corporate Valuation Model

To understand the effect of shareholder taxes on the firm's value, we develop a model of investor taxes and the valuation of corporations. The role of taxes on investments in equities has been an unresolved area of research since Miller and Scholes.[20] In summary, dividends should never be paid when they are taxed more

16 See, for example, Maurice Evans, "Telus Soars on Conversion: Shares Jump 13.8%," *National Post*, September 12, 2006.

17 It is worthy of note that in Canada, not all income trusts changed their organizational form on or before January 1, 2011. Fink identifies five reasons for previous trusts to continue in this form: Jim Fink, "The Last Canadian Income Trusts: Reasons Not To Convert," *Investing Daily*, January 13, 2011. As of April 1, 2011, more than 30 income trusts (other than REITs) remained.

18 See supra note 3.

19 See supra note 2.

20 Supra note 1.

heavily than capital gains; in these circumstances, forgoing the dividend payment in favour of share appreciation improves the after-tax wealth of the investor. While the penalty applied to dividends relative to capital gains is generally lower in Canada than has traditionally been the case in the United States, the tax rate on dividends is higher than the rate on capital gains for individuals in most jurisdictions. In addition, because tax systems typically apply the realization principle to capital gains, the tax rate on capital gains is the accrual-equivalent rate, not the statutory rate. Various models have been produced to attempt to explain the empirical observations that corporations pay dividends in spite of the tax penalty, and to model the effects of dividend taxation on corporate decisions.

From this literature, two models have emerged.[21] The first model, the so-called traditional view (described in, for example, Poterba and Summers),[22] imposes an arbitrary need for dividends, such as the signalling hypothesis.[23] As described more formally below, this model assumes that the marginal source of equity financing for investment is new capital issues. The cost of capital of the firm under this view is a firm-level weighted average of the tax rate on dividends and the tax rate on capital gains. The second model, referred to as "the new view" or "the tax capitalization view,"[24] assumes that the marginal source of equity financing is retained earnings, and that dividends are a residual payment when poor alternative investment opportunities exist. This assumption, thought to apply particularly to some mature firms, causes all dividend taxes to be fully capitalized into the value of the firm; accordingly, altering the dividend tax rate will not affect dividend policy. Dividend tax rates do affect firm value, but do not affect the firm's cost of capital.[25]

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21 Some discussions (for example, Poterba and Summers, supra note 11) also include additional models, such as the model referred to as the "tax irrelevance view" (which we do not discuss here because it does not seem to be empirically supported) and the more recent model of Chetty and Saez, which is based on agency theory: Raj Chetty and Emmanuel Saez, "Dividend and Corporate Taxation in an Agency Model of the Firm" (2010) 2:3 *American Economic Journal: Economic Policy* 1-31.

22 Poterba and Summers, supra note 11.

23 See, for example, Stephen A. Ross, "The Determination of Financial Structure: The Incentive-Signalling Approach" (1977) 8:1 *Bell Journal of Economics* 23-40; and Kevin Rock and Merton H. Miller, "Dividend Policy Under Asymmetric Information" (1985) 40:4 *Journal of Finance* 1031-51.

24 See, for example, Mervyn A. King, "Taxation and the Cost of Capital" (1974) 41:1 *Review of Economic Studies* 21-35; Mervyn A. King, *Public Policy and the Corporation* (London: Chapman and Hall, 1977); Alan J. Auerbach, "Wealth Maximization and the Cost of Capital" (1979) 93:3 *Quarterly Journal of Economics* 433-46; Alan J. Auerbach, "Stockholder Tax Rates and Firm Attributes" (1983) 21:2 *Journal of Public Economics* 107-27; Auerbach, supra note 13; and Alan J. Auerbach and Kevin A. Hassett, "On the Marginal Source of Investment Funds" (2003) 87:1 *Journal of Public Economics* 205-32.

25 Underlying both the traditional view and the tax capitalization view is the basic discounted cash flow model that is the starting point for the common model in accounting research (Ohlson, supra note 5; and Feltham and Ohlson, supra note 14). However, efforts to incorporate taxes

More formally, the models begin with the firm's required cost of capital, ρ, given by the following:[26]

$$\rho V_t = (1 - \tau_d)\, D_t + (1 - \tau_g)\,(V_{t+1} - V_t - S_t) \tag{1}$$

where
V_t = market value of the equity of the firm,
D_t = taxable dividends paid,
S_t = value of new shares issued, and
τ = tax rate on source (subscript d for dividends or subscript g for capital gains).

Note that in the equations that follow the source to which τ applies is represented variously by k (unspecified) or by d, g, c (corporate income), or i (trust distributions).

In appendix A, we constrain dividend payments and new share issues following Auerbach,[27] with associated Lagrange multipliers λ and μ, respectively, and incorporate a minimum dividend payout ratio, γ. These refinements yield the following expression for the firm's value:

$$V_t = \sum_{j=t}^{\infty}\left(\prod_{k=t}^{j}\left(1 + \frac{\rho}{\left(1-\tau_g\right)\left(1-\lambda_k\gamma\right)}\right)\right)^{-1} \times \frac{1}{1-\lambda_j\gamma}\left[\left(\frac{1-\tau_d}{1-\tau_g} + \lambda_j\left(1-\gamma\right)\right)D_j + \left(\gamma\lambda_j + \mu_j - 1\right)S_j\right]. \tag{2}$$

Equation 2 is a discrete-time analog to equation 2.8 in Auerbach.[28]

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directly into the Feltham-Ohlson model have proven controversial. See, for example, Trevor S. Harris, R. Glenn Hubbard, and Deen Kemsley, "The Share Price Effects of Dividend Taxes and Tax Imputation Credits" (2001) 79:3 *Journal of Public Economics* 569-96; Trevor S. Harris and Deen Kemsley, "Dividend Taxation in Firm Valuation: New Evidence" (1999) 37:2 *Journal of Accounting Research* 275-91; and Julie H. Collins and Deen Kemsley, "Capital Gains and Dividend Taxes in Firm Valuation: Evidence of Triple Taxation" (2000) 75:4 *The Accounting Review* 405-27. Some researchers challenge the application of taxes using this approach: see, for example, Michelle Hanlon, James N. Myers, and Terry Shevlin, "Dividend Taxes and Firm Valuation: A Re-examination" (2003) 35:2 *Journal of Accounting and Economics* 119-53; and Dan Dhaliwal, Merle Erickson, Mary Margaret Frank, and Monica Banyi, "Are Shareholder Dividend Taxes on Corporate Retained Earnings Impounded in Equity Prices? Additional Evidence and Analysis" (2003) 35:2 *Journal of Accounting and Economics* 179-200. Our approach differs significantly from the existing literature because we do not start with the Feltham-Ohlson equation and layer on tax attributes, but rather begin with a model of after-tax discounted cash flows and build in key insights from the Feltham-Ohlson model.

26 This first equation is the starting point of Poterba and Summers, supra note 11. Auerbach, supra note 13, begins with a similar equation in continuous time.

27 Supra note 13.

28 Ibid.

Next, we introduce the clean surplus relation.[29] In typical applications of the clean surplus relation to this situation, net share issuances, S, are incorporated into the "dividend" cash flow. Because dividends and share issuances attract different tax treatment for the investor, they are separate in equation 2, and we adjust the clean surplus relation as follows:

$$B_t \equiv B_{t-1} + (1-\tau_c)X_t - D_t + S_t \tag{3}$$

where
B_t = the book value of the equity of the firm and
X_t = pre-tax earnings.

We define X as the pre-tax earnings to permit comparison with income trusts that do not face entity-level taxation. By modelling X as earnings before taxes, we model the activities of the business entity before the effects of organizational structure are added. Solving equation 3 for S and substituting it into equation 2, the firm's problem is

$$V_t = \sum_{j=t}^{\infty}\left(\prod_{k=t}^{j}\left(1 + \frac{\rho}{(1-\tau_g)(1-\lambda_k\gamma)}\right)\right)^{-1} \times \frac{1}{1-\lambda_j\gamma}\left[\left(\frac{1-\tau_d}{1-\tau_g} + \lambda_j + \mu_j - 1\right)D_j + (\gamma\lambda_j + \mu_j - 1)\left(B_j - B_{j-1} - (1-\tau_c)X_j\right)\right]. \tag{4}$$

In equilibrium, the firm will pay optimal dividends each period. The first-order condition with respect to dividends is

$$\lambda_j + \mu_j = 1 - \frac{1-\tau_d}{1-\tau_g}. \tag{5}$$

Substituting equation 5 into equation 4 reduces the firm's problem to

$$V_t = \sum_{j=t}^{\infty}\left(\prod_{k=t}^{j}\left(1 + \frac{\rho}{(1-\tau_g)(1-\lambda_k\gamma)}\right)\right)^{-1} \times \left(\frac{\mu_j}{1-\lambda_j\gamma} - 1\right)\left(B_j - B_{j-1} - (1-\tau_c)X_j\right). \tag{6}$$

This equation continues to have the same basic form as a discounted dividend model where the discount rate is a function of the required after-tax rate of return, the tax rate on capital gains, and the Lagrange multiplier on the dividend constraint multiplied by the dividend payout ratio. To simplify equation 6 to the typical empirical equation, we further assume that the tax rates do not vary across time.[30]

29 Feltham and Ohlson, supra note 14.

30 See, for example, Patricia M. Dechow, Amy P. Hutton, and Richard G. Sloan, "An Empirical Assessment of the Residual Income Valuation Model" (1999) 26:1-3 *Journal of Accounting and Economics* 1-34.

Further, as discussed more fully below, in equilibrium at least one of the Lagrange multipliers in equation 5 will equal zero. With these conditions, equation 6 is algebraically equivalent to the following:[31]

$$V_t = \left(1 - \frac{\mu}{1-\lambda\gamma}\right) \left\{B_t + \sum_{j=t}^{\infty}\left(1 + \frac{\rho}{(1-\tau_g)(1-\lambda\gamma)}\right)^{t-j-1}\left[(1-\tau_c)X_{j+1} - \frac{\rho}{(1-\tau_g)(1-\lambda\gamma)}B_j\right]\right\}. \quad (7)$$

The expression inside the square brackets is "abnormal earnings" that capture future earnings in excess of the required return on start-of-period book value of equity.

Thus far, we have described a basic equation for the value of the firm, incorporating taxes and assuming that the firm generates the required after-tax rate of return. We have then incorporated constraints on the firm's ability to pay dividends and raise capital. Finally, we have included the standard accounting clean surplus relation and simplified the expression to the Ohlson model's residual income valuation.

At this point, it is useful to return to the two equilibrium models described earlier. Under the tax capitalization view of dividend taxation, the firm will not raise additional capital and will pay dividends from its earnings. Thus, $\lambda = 0$. Under this condition and substituting in the value of μ from equation 5, equation 7 simplifies to

$$V_t = \frac{1-\tau_d}{1-\tau_g}\left\{B_t + \sum_{j=t}^{\infty} R^{t-j-1}\left[(1-\tau_c)X_{j+1} - (R-1)B_j\right]\right\} \quad (8)$$

where

$$R = 1 + \frac{\rho}{1-\tau_g}.$$

Consistent with Auerbach[32] and with Poterba and Summers,[33] the cost of capital under tax capitalization is the same as in equation 3 and only affected by the capital gains tax rate. The value of the firm overall, however, is affected by the tax penalty associated with dividends, $(1-\tau_d)/(1-\tau_g)$.

Under the traditional view of dividend taxation, the firm will raise additional capital to fund future investment and only pays the minimum dividends. Thus, $\mu = 0$. Under this condition and again using equation 5, equation 7 simplifies to

$$V_t = B_t + \sum_{j=t}^{\infty} R^{j-t+1}\left[(1-\tau_c)X_{j+1} - (R-1)B_j\right] \quad (9)$$

31 As commonly noted in the literature, this simplification assumes that the terms converge to zero as j approaches infinity.

32 Supra note 13.

33 Supra note 11.

where

$$R = 1 + \frac{\rho}{1-(1-\gamma)\tau_g - \gamma\tau_d}.$$

In this case, the cost of capital is a weighted average of the tax rates on capital gains and on dividends, where the weights are the payout ratio. Here, the overall firm value is not discounted for the dividend tax penalty, as was the case in equation 8.

There continues to be debate within the public economics literature about which of these views is more appropriate for particular types of firms. Tests of the models generally focus on investment or dividend payment behaviour. Recent work (for example, by Auerbach and Hassett,[34] and conceded by Poterba[35]) provides evidence consistent with neither model's holding universally. In particular, Auerbach and Hassett[36] show that firms with poor access to the capital markets (those without bond ratings or an analyst following) and firms that are very mature have empirical relations more consistent with the new view, whereas firms that have good access to capital markets and are not yet large or mature have empirical characteristics more consistent with the traditional view. Since we believe that the firms in our sample, described more fully below, most likely fall in the latter category, our hypotheses are based on the traditional view—that is, on equation 9.[37]

Extending the Model to Valuation of a Flowthrough Entity

For a flowthrough structure, the entity-level tax is forgone and the firm may be required to make distributions to unitholders equal to taxable earnings.[38] Taxable distributions are taxed at the investors' ordinary rates, and capital gains continue to be taxed at the capital gains rate on realization. Thus, for such a structure, the value of the firm specified in equation 1 continues to hold except that the tax rate on taxable distributions, D, is τ_i rather than τ_d. The firm's financial policies are also much simpler because distributions are constrained to equal pre-tax income, X. Thus, equation 3 becomes

$$B_t \equiv B_{t-1} + S_t, \tag{3'}$$

34 Auerbach and Hassett, supra note 24.

35 James Poterba, "Taxation and Corporate Payout Policy" (2004) 94:2 *American Economic Review* 171-75.

36 Auerbach and Hassett, supra note 24.

37 If one adopts the tax capitalization view, the models imply that, in the regressions below, the coefficient on the corporation's book value and pre-tax income, relative to those on income trusts, would be reduced by a factor of $(1 - \tau_d)/(1 - \tau_g)$, or approximately 0.8 for a top tax-rate individual.

38 We assume that the flowthrough entity must pay out its entire earnings because, as described more fully below, this is true for our empirical setting—that of Canadian income trusts.

and equation 7 becomes (as explained in appendix A)

$$V_t = B_t + \sum_{j=t}^{\infty} R^{t-j-1}\left(\frac{1-\tau_i}{1-\tau_g} X_{j+1} - (1-R) B_j\right) \tag{10}$$

where

$$R = 1 + \frac{\rho}{1-\tau_g}.$$

For an income trust, the cost of capital is the same as for a corporation under the tax capitalization view. However, the multiple on equity book value and on overall residual income is 1, consistent with the traditional view. The multiple on future earnings differs across equations 8, 9, and 10.

Empirical Implications of Corporate and Flowthrough Entity Valuation

Opportunities to collect empirical evidence on any potential general market predictions based on equations 8 and 9 relative to equation 10 are limited, since flowthrough entities around the world have mostly been restricted to the real estate and oil and gas industries (for example, REITs) or private enterprises; therefore, these settings provide only limited insights. However, beginning in the late 1990s and through 2006, businesses increasingly exploited the benefits of the flowthrough business structure in Canadian industries, beyond real estate and oil and gas. The extensive use of this structure across most industries in Canada during this period provides a unique opportunity to collect empirical evidence through cross-sectional analysis. We therefore apply the details of the Canadian tax setting during this period to the model previously described, to derive and later test empirical predictions of the valuation effects of investor- and corporate-level taxes on common equity.

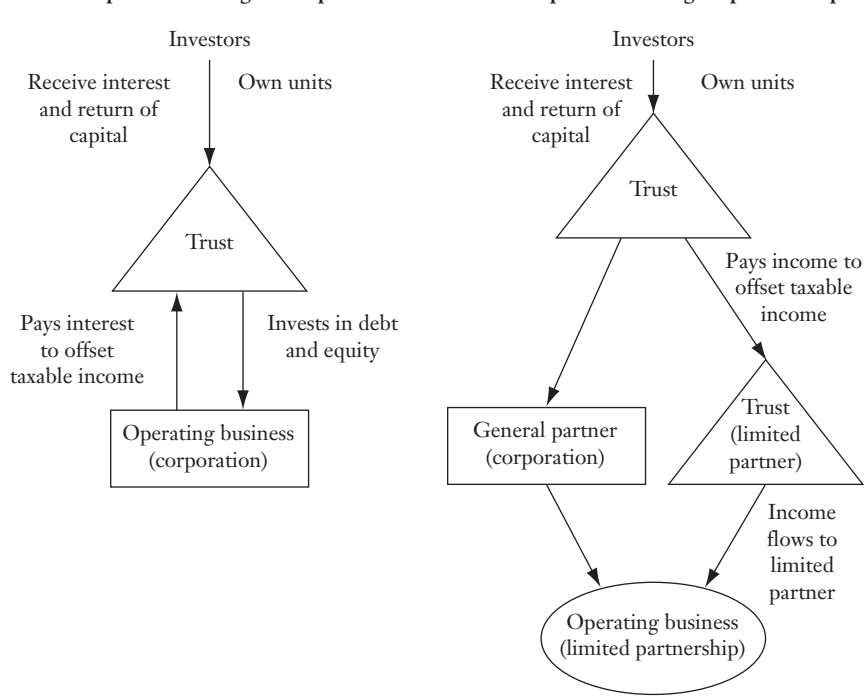
INSTITUTIONAL SETTING

Summary of the Canadian Income Trust Structure

An income trust is a structure that *simulates* a flowthrough entity. While this structure has enjoyed a long history in the real estate industry, in the early 2000s it became a popular investment vehicle in most sectors of the Canadian equity market, owing to its tax advantages and high payout rates.

Early income trusts were structured as a mutual fund trust that held all the shares of a corporation with business operations, plus a significant amount of debt in the corporation. This basic structure is illustrated in figure 1. Interest, royalty, or lease payments to the trust reduced the corporation's taxable income to zero, allowing it to avoid paying corporate income taxes. Interest paid to the trust was distributed to the unitholders monthly, with additional payments made at the end of the year as needed to achieve the goal of distributing all taxable income for the year. Over time, the structure evolved in different forms to avoid the use of a corporation to hold the

FIGURE 1 Basic Structure of an Income Trust



operations. Figure 1 illustrates one such form that substitutes a partnership arrangement, instead of a corporation, to hold operations.[39]

As a flowthrough structure, the income trust avoided the double taxation that comes from combining corporate income tax with a shareholders' dividend or capital gains tax.[40] Unlike a true flowthrough entity (such as a partnership or, in the United States, an S corporation or a limited liability corporation), before the tax regime was changed, an income trust avoided incurring tax only if it distributed its taxable income each year. The distributions of income to the unitholder faced normal taxation, usually in the form of interest, business income, royalties, or lease income.

Appendix B to this article provides a brief overview of the advantages and disadvantages of income trusts as an investment vehicle.

39 The use of a partnership structure provides additional benefits by avoiding capital taxes and any inefficiency that may otherwise arise from the inability to predict the business's taxable income.

40 We recognize that the dividend tax credit provides a partial reduction for the double taxation caused by taxing both the corporation's income and the individual's resulting dividend.

Development of the Income Trust Market

Prior to 1995, the large majority (90 percent) of income trusts were traditional real estate or royalty trusts.[41] However, after the rapid market decline in the mid-1990s, when initial public offerings (IPOs) and seasoned equity offerings were difficult to sell, there was a significant demand for the income trust structure.[42] Demand was also strong among fixed-income individuals, owing to high trust distributions relative to very low interest rates. As a consequence, income trusts expanded rapidly into other business sectors. In October 2006, REITs accounted for 14 percent of all income trusts; oil and gas royalty trusts accounted for 40 percent; utility trusts accounted for 9 percent; and the remaining 37 percent were other types of business trusts.[43]

In the period from the end of 2001 to the end of 2004, the total market capitalization for income trusts increased by a factor of four, and by October 2006, the market capitalization of these entities exceeded $207 billion, representing more than 10 percent of the domestic capital market.[44] On January 26, 2005, Standard and Poors announced that it would be including income trusts in the S&P/TSX composite index beginning in the fourth quarter of 2005, providing further evidence of the acceptance and importance of income trusts in Canadian capital markets.[45] On October 31, 2006, there were 256 traded income trusts, many of which had raised additional capital through subsequent unit issues.

With the growing popularity of income trusts, the use of this type of investment structure came under increased scrutiny by the Canadian government. In particular, the government became concerned that the flowthrough nature of these entities resulted in a significant revenue loss. Additionally, there were concerns about the long-term effects that a structure designed primarily for tax avoidance would have on business growth and entrepreneurship, owing to the high amount of profits distributed to unitholders. Some studies provide support for this skepticism by suggesting that flowthrough structures such as income trusts do little to improve our capital markets.[46] In September 2005, the Department of Finance issued a consultation

41 Lalit Aggarwal and Jack Mintz, "Income Trusts and Shareholder Taxation: Getting It Right" (2004) 52:3 *Canadian Tax Journal* 792-818.

42 Vijay Jog and Liping Wang, "The Growth of Income Trusts in Canada and the Economic Consequences" (2004) 52:3 *Canadian Tax Journal* 853-80.

43 Based on market capitalization (Deloitte, "Facing the New Realities for Publicly Traded Trusts and Partnerships," 2007). Oil and gas trusts were the largest, with average market capital in October 2006 of $2.6 billion.

44 PricewaterhouseCoopers, "Income Trusts Have Earned a Central Place in the Economy, PwC Survey Shows," January 4, 2006 (www.marketwire.com/press-release/pricewaterhousecoopers-income-trusts-have-earned-central-place-economy-pwc-survey-shows-574132.htm).

45 Gregory Chrispin, "Income Trusts: The Changing Canadian Landscape," State Street Global Advisors, Index Equity Essays and Presentations, 2005 (www.ssga.com/library/esps/gregchrispincanadianlandscape20050531/page.html).

46 See, for example, Tim Edgar, "The Trouble with Income Trusts" (2004) 52:3 *Canadian Tax Journal* 819-52.

paper on income trusts and flowthrough entities and imposed a moratorium on advance tax rulings for proposed income trusts.[47] These actions suggested that the government would like to halt the creation of new income trusts, at least temporarily. On October 31, 2006, the government announced that distributions to unitholders of publicly traded income trusts and partnerships (excluding REITs) would be taxed at regular corporate rates.[48] Unitholders would receive a tax credit equal to the tax paid by the income trust. The new tax would effectively preserve the same tax treatment for taxable Canadian investors, but would make the taxation of income trusts equivalent to that of corporations for exempt and foreign investors. The new rules would apply in 2007 to any new income trust that commenced public trading after October 31, 2006 and to existing income trusts after a four-year transition period, under certain growth limitations.

Edwards and Shevlin explore the market pricing reaction to this change in Canadian tax policy for a sample of income trusts.[49] Their event study estimates an average, market-adjusted market reaction of −10 percent, which they claim is consistent with a foreign investor from a country with a tax rate of approximately 35 percent, and provides a triangulation on the estimates found below.

Tax Rates in Canada in 2002-2005

Our study focuses on the period 2002-2005, before the Canadian government announced the change in tax policy described above. Since distributions to investors in income trusts were treated as regular income, they were taxed at individual statutory rates: top statutory rates on individuals were 46 percent in Ontario in 2005, and ranged from 39 percent in Alberta to almost 49 percent in Newfoundland and Labrador.[50]

For corporations carrying on business in Canada, the applicable tax rate depended on whether or not the corporation was a Canadian-controlled private corporation, the type of income earned, and the province in which the income was earned. A publicly traded corporation operating exclusively in Ontario faced a tax rate of approximately 36 percent during our sample period. The rates across provinces in 2005 varied from 31 percent in Quebec to 39 percent in Saskatchewan.

To provide partial relief for the corporate-level tax, dividends and capital gains were not fully taxed. The individual taxation of dividends in Canada attempted to integrate the corporate and personal tax systems at a theoretical corporate rate of

47 Canada, Department of Finance, *Tax and Other Issues Related to Publicly Listed Flow-Through Entities (Income Trusts and Limited Partnerships)* (Ottawa: Department of Finance, September 2005).

48 Canada, Department of Finance, "Canada's New Government Announces Tax Fairness Plan," *News Release* 2006-061, October 31, 2006.

49 Edwards and Shevlin, supra note 6.

50 Unless otherwise indicated, all tax rates cited in the discussion that follows are those in effect for 2005—the last full year in our sample. Individual tax rates were very stable over the period 2001-2006, while corporate tax rates declined.

20 percent. Thus, dividends were included in income at 125 percent, and a tax credit was granted that theoretically equalled 20 percent of the grossed-up dividend, though the actual rate varied by province. The effect of these rules was to tax dividends at a maximum rate of 31 percent in Ontario; in other provinces, the maximum rate ranged from 24 percent in Alberta to 37 percent in Nova Scotia and in Newfoundland and Labrador. For public corporations that owned shares, dividends were exempt from taxation (that is, corporations received a 100 percent dividend deduction). In the case of capital gains, the same rule applied to all taxpayers: only one-half of realized capital gains were included in income. Thus, for example, the maximum tax rate for capital gains in Ontario for individuals was 23 percent, half of the maximum tax rate on ordinary income.

Given these features of the tax system, the overall tax rate applicable to a corporate form depended not only on the tax rate of the investor but also on when the investor realized the dividend or capital gains. Appendix C illustrates the integration of corporate and shareholder taxation, and includes a table (table C.1) that specifies the after-tax value of a $1,000 investment to an investor across a variety of scenarios.

HYPOTHESIS DEVELOPMENT AND RESEARCH DESIGN

Application of the Model to Canadian Income Trusts

In order to empirically estimate the valuation equations 9 and 10 for corporations and income trusts, respectively, Ohlson[51] and Lundholm[52] identify the need for information dynamics. That is, what information is contained in current abnormal earnings that permits the prediction of future values, and what other information is available currently that will be reflected in current prices and future earnings? Ohlson[53] and Hand[54] specify the empirical equation as follows (using consistent notation as above):

$$V_t = \alpha_1 B_t + \alpha_2 (1 - \tau_c) X_{j+1} + \alpha_3 \nu_t \tag{11}$$

where

$\alpha_1 = (R - 1)\omega/(R - \omega)$, where ω represents the autoregressive parameter on abnormal earnings;

$\alpha_2 = R\omega/(R - \omega)$;

$\alpha_3 = R/[(R - \omega)(R - \varphi)]$, where φ represents the autoregressive parameter on additional information; and

ν_t = additional information beyond what is in X_t.

51 Supra note 5.

52 Russell J. Lundholm, "A Tutorial on the Feltham/Ohlson Models: Answers to Some Frequently Asked Questions" (1995) 11:2 *Contemporary Accounting Research* 749-61.

53 James Ohlson, "Earnings, Book Value, and Dividends in Equity Valuation: An Empirical Perspective" (2001) 18:1 *Contemporary Accounting Research* 107-20.

54 John R.M. Hand, "Discussion of 'Earnings, Book Values, and Dividends in Equity Valuation: An Empirical Perspective'" (2001) 18:1 *Contemporary Accounting Research* 121-30.

For income trusts, the regression is altered in accordance with equation 10 relative to equation 9, as follows:

$$V_t = \alpha_1 B_t + \alpha_2 \frac{1-\tau_i}{1-\tau_g} X_{j+1} + \alpha_3 \nu_t. \tag{12}$$

As discussed in greater detail below, if we assume that the coefficients in equations 11 and 12 are independent of an organization's form, by comparing the coefficients on pre-tax income across corporations and income trusts we can infer the underlying tax characteristics of the investors in income trusts. Comparison of equations 11 and 12 suggests that the coefficient on pre-tax income, X, incorporates a factor of $(1-\tau_c)$ for corporations and $(1-\tau_i)/(1-\tau_g)$ for income trusts. While the statutory value of τ_g is one-half of τ_i, in modelling τ_g we use the annualized (accrual) equivalent to the realized statutory value. In this context, King[55] estimates a UK "effective" capital gains tax rate that is less than half the statutory rate; however, such a low effective capital gains rate requires long investment horizons and/or high discount rates. As a lower bound, if we assume that τ_g is one-quarter of τ_i, rather than one-half, yielding a tax factor of $(1 - 3\tau_i/(4 - \tau_i))$, and as an upper bound, if we assume no deferral, so that τ_g is one-half of τ_i, the tax factor is $(1 - \tau_i/(2 - \tau_i))$. Using Ontario and BC tax rates in 2005 for illustration, $(1-\tau_c)$ would equal 0.64 and 0.65, respectively, and $(1-\tau_i)/(1-\tau_g)$ would range from 0.61 to 0.70 for top-rate individuals.[56] Thus, for top-rate individuals, the coefficients on X for corporations and for income trusts should be similar. As the personal tax rate decreases, the coefficient on X will decrease for corporations and the tax factor for income trusts will approach 1. This analysis leads to the following null hypothesis:

Hypothesis 1: The pre-tax income coefficient for corporations is greater than or equal to the pre-tax income coefficient for income trusts.

Rejecting this hypothesis is consistent with an average investor-level tax rate[57] for income trusts that is significantly below the top marginal rate, whereas failing to reject this null hypothesis implies that income trusts are priced as though investors

55 King, *Public Policy and the Corporation*, supra note 24.

56 The accrual-equivalent capital gains tax rate depends upon the period until realization and the discount rate. To estimate the discount rate for an investment in an income trust, we computed the implied cost of capital for our sample of income trusts using the method described by Dhaliwal et al., supra note 9. The mean expected return on income trusts is 12 percent using this method. For a five-year horizon with the 12 percent discount rate, the annualized τ_g is 42 percent of τ_i. This value would yield a fraction of approximately 0.67 and 0.69 for Ontario and British Columbia, respectively.

57 Here we intentionally use the term "average investor" rather than "marginal investor," consistent with the analysis of Guenther and Sansing, supra note 10.

pay a high rate of individual tax. These predictions are consistent with the calculations in appendix table C.1, which show that the after-tax values are similar between corporations and income trusts for top-rate investors (taxed at 46 percent), but for lower-rate investors (taxed at 25 percent or zero percent) the after-tax values increase more for income trusts than for corporations.

Match Design Empirical Approach

To interpret the comparison of coefficients across two organizational forms as being driven by the tax factors, samples of corporations and income trusts with similar underlying valuation processes are needed. That is, R and ω from equations 11 and 12 are as similar as possible across the two samples. On the basis of the analysis above[58] and in table C.1, the benefit of being an income trust is largest for businesses that are mature and stable, rather than growing through internally generated value. While a mature, stable business may be the best fit for the income trust structure, the lack of available new capital led a wide spectrum of businesses to choose this structure.[59]

Huson and Pazzaglia[60] analyze the 248 firms that undertook an IPO in Canada between 1995 and 2005. Of these, 127 used the income trust structure and 121 used a corporation. Huson and Pazzaglia note numerous articles in the press at the time that indicated that the use of an income trust lowers the firm's cost of capital, making "the income trust form attractive also for growth-oriented firms" that would have been traditionally considered a poor fit for this organizational form.[61] Huson and Pazzaglia assert and test an asset-based hypothesis (that the firm chose the organizational form on the basis of asset characteristics) and a market-timing hypothesis

58 See "Extending the Model to Valuation of a Flowthrough Entity."

59 Aggarwal and Mintz, supra note 41.

60 Mark R. Huson and Federica Pazzaglia, *Choice of Organizational Form as a Trade-Off Between Fit and Market Timing*, University of Alberta Working Paper (Edmonton: University of Alberta, School of Business, Department of Finance and Management Science, 2009).

61 Ibid., at 4, citing "Blue-Chip Canada Explores Trust Spin-Offs; Big Names Consider Converting Divisions," *Globe and Mail*, March 30, 2006. Anecdotal evidence also suggests that being an income trust did not prevent growth. Trusts issued additional units regularly. For example, the Yellow Pages Income Fund made its IPO in August 2003 and subsequently offered additional issues of similar size in December 2003, in 2004, and in 2005. AltaGas Income Trust also issues units on a frequent basis, and had a distribution reinvestment plan as well. This plan allowed unitholders to receive more units rather than cash distributions; the new units were issued at 95 percent of market price. The plan was offered from 2004 to 2007. At the end of 2006, 127 trusts offered distribution reinvestment plans, with 80 of them offering new units at a discount. Further, PricewaterhouseCoopers cites research by Canaccord Adams that shows that for income trusts, average sales reinvestment in capital expenditures in 2006 was twice the rate of the TSX 60: PricewaterhouseCoopers, "Income Trust Report," PwC Research (Toronto, December 11, 2006).

(that the firm chose the organizational form on the basis of which traded at a higher value at the IPO date). They provide empirical support for both hypotheses, with age, the ratio of operating income to assets, and relative price-earnings ratios explaining the organizational choice. They conclude that firms trade off the two motivations. In tests of subsequent performance, they also employ propensity scoring to identify corporations and income trusts that had similar asset characteristics ex post, similar to our empirical approach. On the basis of the evidence presented by Huson and Pazzaglia that the market conditions at the time of the IPO were important to the creation of income trusts, we believe it is possible to construct two samples with similar values of R and ω that will allow our design to test our tax hypotheses.

Research Design

To test the hypotheses, we employ a standard Ohlson valuation model but include interactions for corporations. Estimating such an equation has several challenges. First, it is subject to heteroskedasticity owing to the significant variation in exogenous factors across firms, and it is also subject to concerns over the stationarity of the relation as described in equation 13.[62] To address these concerns, we deflate all variables in the equation by book value of equity.[63]

Finally, we proxy additional information with sales growth ($GROWTH$), industry (I), and year (Y) to create the following equation:

$$\frac{MV_t}{BV_t} = \beta_1 + \beta_2 \frac{PTI_t}{BV_t} + \beta_3 GROWTH_t + \beta_4 C + \beta_5 C \times \frac{PTI_t}{BV_t} + \beta_6 C \times GROWTH_t + I + Y_t + \varepsilon_t. \quad (13)$$

C is an indicator variable for taxable corporations; MV is the fiscal year-end closing price;[64] BV is the book value of equity; PTI is calculated as net income less tax expense; and $GROWTH$, which captures other information that is not currently captured by the accounting system, is measured as contemporaneous growth in sales. These data

62 See John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets* (Princeton, NJ: Princeton University Press, 1996).

63 Barth and Kallapur argue that deflation does not solve issues of bias or heteroskedasticity, though they do not consider the stationarity that is at issue in Campbell et al., supra note 62: Mary E. Barth and Sanjay Kallapur, "The Effects of Cross-Sectional Scale Differences on Regression Results in Empirical Accounting Research" (1996) 13:2 *Contemporary Accounting Research* 527-67. We use quantile regression, as discussed below, to address issues of bias. As a specification checking procedure, we also include BV and $C \cdot BV$, and separately include $1/BV$ and $C \cdot 1/BV$, as additional regressors. (See below for a description of these terms.) Finally, we deflate by total assets (with and without including BV). In all cases, the coefficients on the added variables are very close to zero and do not alter the inferences drawn.

64 All income trusts in our sample have a December 31 year-end.

were collected from Compustat[65] for the taxable corporations and from the annual reports on SEDAR[66] for the income trusts. The interaction of *C* and *PTI* is included to test hypothesis 1 and because the theoretical coefficients on these variables differ across organizational structures, as specified in equations 11 and 12. A negative coefficient on this interaction would reject hypothesis 1 in favour of the predicted alternative.

Diagnostic procedures also reveal that the ordinary least squares assumptions are violated by errors that are not normally distributed. In particular, the skewness and kurtosis test of normality is rejected at the 0.1 percent level. To address this econometric issue, we employ a quantile regression estimate. This technique employs a median regression that minimizes the mean absolute errors, rather than the mean square errors. As a consequence, the effects of extreme observations are reduced without the need to winsorize or truncate the data.[67] Finally, we use a matched sample of firms, as described below, to address concerns over self-selection and correlated omitted variables.

To estimate equation 13, we collected data on income trusts in Canada. From the population of approximately 250 income trusts as of November 1, 2006, we eliminated REITs and financial firms, owing to their unique asset mix and operating characteristics.[68] We also required the book value of equity and pre-tax income to be positive. After applying data requirements, and since the number of income trusts is growing, the final sample includes 30 for 2002, 43 for 2003, 59 for 2004, and 57 for 2005.[69] The total sample is 189.[70]

We chose a matched sample beginning with all of the firms in the Canadian file of Compustat. After removing the income trusts that are included in Compustat from 2002 through 2005, we were left with more than 4,000 corporations from which to select a sample matching our 189 income trusts. We matched the firms using a propensity score matching method. This method has been used extensively in many other disciplines, including the medical sciences and more recently in the

65 Capital IQ Compustat (www.compustat.com).

66 (www.sedar.com).

67 The quantile regression, while a different approach, yields results that are qualitatively similar to robust regressions.

68 Our final sample was further restricted to firms with a full 12 months of operation as an income trust, resulting in the loss of 85 income-trust years because of new startups over the three years.

69 We chose to exclude 2006 firm years because there was much uncertainty surrounding income trusts in the last two months of that year, following the government's announcement that it would begin to impose a new tax on these structures.

70 A breakdown of the sample by industry type is provided in appendix B.

economics literature.[71] Accounting studies such as Lawrence et al.,[72] Armstrong et al.,[73] and Huson and Pazzaglia[74] have also applied this matching method.

Rosenbaum and Rubin[75] first proposed propensity scores as a method to reduce self-selection bias when using observational data. Propensity score matching attempts to reduce this bias as much as possible by increasing the similarity between treated and control observations. This is accomplished by controlling for more pre-treatment characteristics than is possible using other matching techniques. Since matching on multidimensional factors is difficult or unfeasible with a large number of factors, propensity score matching summarizes pre-treatment characteristics of each observation into a single factor—the propensity score—which facilitates matching. Francis and Lennox[76] discuss the benefits of using propensity score matching over traditional self-selection techniques, such as those described by Heckman.[77]

The effectiveness of propensity score matching relies on a key assumption that after one has controlled for the observable factors, membership in the control and matched groups is essentially random. Readers should therefore be aware that our analysis is dependent upon this assumption as well.

We calculated a propensity score that controls for industry, size, and growth within each year, since these are observable characteristics that have been shown by prior studies to differ between income trusts and corporations.[78] Huson and Pazzaglia[79]

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71 Sascha O. Becker and Andrea Ichino, "Estimation of Average Treatment Effects Based on Propensity Scores" (2002) 2:4 *Stata Journal* 358-77; Rajeev Dehejia and Sadek Wahba, "Propensity Score-Matching Methods for Nonexperimental Causal Studies" (2002) 84:1 *Review of Economics and Statistics* 151-61; and James Heckman, Hidehiko Ichimura, Jeffrey Smith, and Petra Todd, "Characterizing Selection Bias Using Experimental Data" (1998) 66:5 *Econometrica* 1017-98.

72 Alastair Lawrence, Miguel Minutti-Meza, and Ping Zhang, "Can Big 4 Versus Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics?" (2011) 86:1 *The Accounting Review* 259-86.

73 Christopher S. Armstrong, Alan D. Jagolinzer, and David F. Larcker, "Chief Executive Officer Equity Incentives and Accounting Irregularities" (2010) 48:2 *Journal of Accounting Research* 225-71.

74 Supra note 60.

75 Paul R. Rosenbaum and Donald B. Rubin, "The Central Role of the Propensity Score in Observational Studies for Causal Effects" (1983) 70:1 *Biometrika* 41-55.

76 See Jere R. Francis and Clive S. Lennox, *Selection Models in Accounting Research*, University of Missouri-Columbia Working Paper (Columbia, MO: University of Missouri-Columbia, College of Business, February 2008).

77 James J. Heckman, "Sample Selection Bias as a Specification Error" (1979) 47:1 *Econometrica* 153-61.

78 We did not include leverage as an observable characteristic in the calculation of our propensity score, even though an income trust structure results in higher post-conversion leverage for the firm than a corporate structure, because the financial instruments used to structure income trusts appear to be inconsistently classified as debt or equity within Compustat. Thus, to the extent that pre-conversion leverage differences were a factor in the decision to become an income trust, we will have bias in our results.

79 Supra note 60.

found that firms that chose to use an income trust structure for their IPO were generally larger than those that used a corporate structure. They also documented variance in use of a particular structure across industries. Although they found that differences in growth opportunities between those issuing as income trusts and those issuing as corporations were not as significant as claimed in the media, we control for this observable factor as well.

Industry was represented by a series of dummy variables representing two-digit North American Industry Classification System (NAICS) codes.[80] The only measure of size that is not dependent on the organizational structure is sales, and so we used this as our size measure. We limited our growth measure to one year to avoid dramatic data loss. Growth is measured as the one-year percentage change in sales. The propensity score was generated using an equal weighting of the three factors within each year. After calculating the propensity scores for income trusts and corporations, we chose the matched corporations from the sampling frame using a nearest-neighbour method without replacement, choosing one matched firm with the closest propensity score to each income trust.[81] This resulted in a sample of 189 matched corporations.

Summary statistics for the 189 income trusts and 189 matched companies are provided in table 1. In spite of including size in our matching procedure, the mean value of sales for the corporations is larger than for the income trusts. In particular, while the distribution is similar to or even somewhat below the 75th percentile, the last quartile is noticeably larger for the companies than the trusts.[82] The distribution of *PTI* and net income is much more similar for income trusts than for corporations, a result that is expected since income trusts generally have little, if any, tax expense. While the distribution of *PTI* is narrower for income trusts, on a deflated basis *PTI* has a more similar distribution across the samples, and within both samples, has a more symmetric distribution.

An industry breakdown of the income trusts and the corporations is provided in table 2. As the table shows, the propensity score matching resulted in a similar distribution across industries for income trusts and corporations, but did not achieve exact industry matching, per se, because industry differences are balanced with growth and size differences.

80 An alternative propensity score matching procedure was run using a continuous variable of industry based on three-digit NAICS codes. Although the procedure did provide different matches for 22 percent of our income trusts, the results of testing using this procedure were substantially similar to those tabulated using the indicator variables for industry.

81 Two income trusts were dropped from the 2003 sample because there were no control group firms with comparable propensity scores. With the exception of these two income trusts, the propensity scores of all matched firms were within 0.001 of each other. Since both of the two dropped entities were more than 0.167 away from their closest control firm, we concluded that for these extreme income trusts, no comparable match could be found.

82 Removing the eight matched companies with sales larger than the largest trust has a very minor effect on the coefficients.

TABLE 1 Summary Statistics for Income Trusts and Corporations Included in Sample

Variable	Mean	Std. dev.	Percentile					Cross-sample tests (p-values)	
			5	25	50	75	95	Mean	Median
Panel A: Income trusts									
Sales	369.76	457.78	29.26	90.24	181.41	445.94	1,502.35	0.15	0.84
Total assets	755.19	943.31	41.79	167.04	399.00	1,031.68	2,661.09	0.54	0.01
Sales growth	0.38	0.56	−0.10	0.05	0.20	0.49	1.84	0.39	0.22
Market value of equity	914.82	1,196.91	34.31	173.29	515.02	1,231.49	1,679.60	0.78	0.01
Book value of equity	385.91	532.01	24.54	79.32	229.38	478.59	1,135.04	0.97	0.01
Pre-tax income	57.50	95.40	2.62	12.96	27.52	60.10	196.66	0.65	0.01
Net income	54.86	93.93	1.53	11.89	24.67	63.39	241.83	0.13	0.01
Price/book value	2.82	2.91	0.90	1.54	2.10	2.79	6.94	0.02	0.04
Pre-tax income/book value	0.20	0.23	0.03	0.08	0.14	0.24	0.49	0.27	0.73
Net income/book value	0.17	0.22	0.03	0.08	0.12	0.18	0.41	0.01	0.01
Panel B: Matched corporations									
Sales	479.83	953.76	16.58	52.23	174.22	435.69	2,364.48		
Total assets	861.13	2,165.04	32.04	110.81	230.55	562.26	3,996.20		
Sales growth	0.44	0.75	−0.15	0.03	0.15	0.43	2.44		
Market value of equity	868.12	1,939.76	13.75	70.89	187.58	641.57	3,431.04		
Book value of equity	387.97	921.51	18.85	59.12	122.75	296.52	1,551.74		
Pre-tax income	63.17	140.11	0.83	5.46	17.43	42.50	271.01		
Net income	41.13	80.03	0.39	3.59	11.58	38.54	192.10		
Price/book value	2.25	1.80	0.47	1.13	1.74	2.75	5.78		
Pre-tax income/book value	0.18	0.20	0.02	0.08	0.14	0.23	0.39		
Net income/book value	0.12	0.10	0.01	0.06	0.10	0.16	0.28		

(Notes to table 1 are on the following page.)

TABLE 1 Concluded

Notes: These summary statistics are for the 189 firm years in each of the income trust sample and the corporation sample. Sales, total assets, book value, earnings before taxes, and net income are the financial statement values from Compustat and SEDAR. Market price is the market price at the fiscal year-end multiplied by share obtained from the Canadian Financial Markets Research Centre database. Cross-sample tests are performed for both means and medians. The test of means is a *t*-test of the null hypothesis that the mean of the income trust sample is the same as the mean of the corporation sample. The test of medians is a chi-square test that the number of observations above and below the median for the combined sample is the same for income trusts and corporations.

EMPIRICAL RESULTS

Main Tests

The results of estimating equation 13 using the data on income trusts and taxable companies are found in table 3. The coefficient for the main effect of *PTI* (that for income trusts) is 7.12. The interaction of *C* with *PTI* is negative, rejecting hypothesis 1 in favour of the predicted alternative. This negative coefficient is consistent with the predictions of the theoretical model when the marginal investor in income trusts faces a low tax rate. The coefficient is −2.61, implying that the coefficient on *PTI* for corporations is estimated to be 4.51. The estimate for corporations is 0.63 times the size of the coefficient on *PTI* for the sample of income trusts. From equations 11 and 12, the implied coefficient for *PTI* for corporations, relative to income trusts, equals

$$\frac{1-\tau_c}{(1-\tau_i)/(1-\tau_g)}$$

in the theoretical model. If the typical corporate tax rate is 36 percent[83] and τ_g is one-quarter of τ_i, the coefficient estimates imply that the investors' average tax rate is slightly less than 0 percent.[84] One must be cautious about drawing strong inferences from a point estimate, given the relatively large standard error of the coefficient on the interaction term. The 95 percent confidence interval around the coefficients implies that the tax rate is reliably less than 7 percent.[85]

83 If we compute a simple effective tax rate as the tax expense over PTI, then the median value for the sample of corporations is 33 percent. If this tax rate is constrained to be between zero and 1, the mean and median values are 32 percent and 34 percent. If the actual corporate tax rate is less than 36 percent, the implied investor tax rate is also lower.

84 Clearly, the average tax rate cannot be less than 0 percent, and drawing point estimates from the regression is very difficult. For example, our matching process is not likely to completely control for differences in expected returns or the autocorrelation of residual earnings.

85 To determine this cutoff, we tested the following constraint: $T \times \hat{\beta}_5 - (0.64 - T)\,\hat{\beta}_2 = 0$. The probability that this constraint holds equals 2.5 percent when $T = 0.948$, a value that implies $\tau_i = 7$ percent.

TABLE 2 Industry Breakdown for Income Trusts and Corporations in Sample

	Income trusts		Corporations	
Industry[a]	No.	Percent	No.	Percent
Energy	82	43	64	34
Utilities	17	9	19	10
Construction and agriculture	13	7	13	7
Manufacturing	22	12	28	15
Wholesale and retail	15	8	27	14
Transportation	18	9	19	10
Services	22	12	19	10
Total	189	100	189	100

[a] Industry labels are based on the North American Industry Classification System (NAICS).

The coefficient on the main effect *C* is not different from zero. This implies that the coefficients on book value in equations 9 and 10 do not differ, consistent with corporations being valued according to the traditional view of dividend taxation, and also consistent with there being no observable difference in the parameter ω, the autoregressive parameter on abnormal earnings. The coefficients for the growth variables show that for income trusts, growth is not related to the price-to-book ratio, once industry and year dummies are considered, and that for corporations, growth is positively related to the dependent measure at a marginally significant level of statistical significance.

As a specification checking procedure, we also re-estimated the regression equation using ordinary least squares and robust standard errors. While the coefficients are similar, the ratio of the implied coefficient on pre-tax income for corporations to that on income trusts is smaller, suggesting a more negative tax rate for income trust investors. To determine whether the larger interaction coefficient is the result of extreme values, we also estimated this equation after winsorizing all variables at the 5 percent and 95 percent levels. The results of this regression (untabulated) are that the coefficients on *PTI* and the interaction of *C* and *PTI* are 11.75 (*t*-statistic of 6.70) and −3.82 (*t*-statistic of 1.56). These coefficients imply a point estimate for the income trust investors' tax rate of approximately 7 percent with a considerably wider confidence interval. The use of the normality assumption on the error term and robust standard error estimates results in *t*-statistics that are lower for the *PTI* coefficients.

Overall, the results of estimating equation 13 reliably demonstrate that the pricing of pre-tax earnings of income trusts is consistent with investors having a low tax rate. While we are cautious about interpreting a point estimate, the coefficients suggest that with a corporate tax rate of approximately 36 percent, the market prices are consistent with the average investor's tax rate being below 7 percent. Using the simulations summarized in table C.1, this tax rate suggests that the pre-tax earnings generated in the income trust structure are tax favoured, overall.

TABLE 3 Valuation Tests of Income Trusts Versus Corporations

Variable	Predicted sign	Quantile regression	Ordinary least squares	Quantile regression
PTI/BV	+	7.12 (34.62)***	9.17 (6.45)***	7.18 (28.79)***
*PTI/BV * ENERGY*	?			−0.25 (−0.71)
C	?	−0.05 (−0.23)	0.28 (0.99)	−0.02 (−0.19)
*C * ENERGY*	?			−0.12 (−0.73)
*C * PTI/BV*	−	−2.61 (−10.57)***	−3.99 (−2.67)***	−2.68 (−9.98)***
*C * PTI/BV * ENERGY*	+			2.34 (3.68)***
GROWTH	+	0.03 (0.42)	−0.04 (−0.25)	0.03 (0.54)
*C * GROWTH*	?	0.18 (1.82)*	0.27 (1.48)	0.08 (0.92)
Industry dummies		Yes	Yes	Yes
Year dummies		Yes	Yes	Yes
Pseudo R^2/R^2		34%	63%	35%

Notes: These regressions are estimated using 378 firm years using quantile regression or ordinary least squares with robust standard errors. The dependent variable is market value of equity, based on year-end stock price, divided by book value of equity. *PTI* is earnings before taxes using values from the financial statements. *C* is an indicator variable that takes on a value of 1 if the observation is a corporation and zero if it is an income trust. *GROWTH* is the one-year growth in sales. Industry dummies are based on the firm's two-digit industry classification based on the North American Industry Classification System (NAICS). *ENERGY* firms are identified as those in NAICS 21. Statistical significance of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively. Tests of hypotheses are conducted using one-sided tests when directional predictions are made and two-sided tests when non-directional predictions are made.

Additional Analysis

While the average investor in an income trust may face a low tax rate, the investor characteristics are not the same for all income trusts. In particular, investors are reported to fall into three broad groups: (1) institutional investors and units held within tax-deferred retirement accounts (registered retirement savings plans); (2) Canadian individuals; and (3) foreign (mostly US) investors. It is believed that investors in the first group behave as though they face a zero tax rate. The second group is believed to consist of lower-income individuals, who also face a low tax rate. Foreign investors, however, face a higher tax rate, since any distributions from

the income trust will be subject to a tax rate of at least 15 percent through the imposition of withholding tax.[86] In testimony before the House of Commons Standing Committee on Finance in early 2007, the minister of finance reported that for large energy trusts, 50 percent of the ownership is foreigners.[87] Further, the Department of Finance estimated that in 2004 the average level of foreign ownership of energy trusts was 3.7 times higher than that of business trusts.[88] Specifically, on the basis of estimates for that year, ownership by investors in the three groups (institutions, domestic individuals, and foreign investors) was 45 percent, 45 percent, and 10 percent respectively for business trusts, but 31 percent, 31.5 percent, and 37.5 percent respectively for energy trusts. Thus, we would predict different coefficients for energy firms relative to other firms.

To test this assertion, we interacted an energy industry dummy—that is, firms in NAICS 21—with the *PTI/BV* variables.[89] The results are shown in the last column of table 3. The pattern of coefficients suggests that the coefficient on *PTI* is 7.18 for non-energy trusts and 4.50 for non-energy corporations, very similar to the main results. However, for energy firms, the coefficient is 6.93 for income trusts and 6.60 for corporations. These two are not statistically different using a 10 percent cutoff value. Thus, our tests reveal that the valuation of income trusts relative to corporations is different for energy firms than for other industries. The coefficients imply that investors' tax rates for non-energy trusts are low; however, for energy trusts, we cannot reject the null hypothesis that the rates are close to the maximum individual rate. The 95 percent confidence intervals suggest that the pricing of corporations and income trusts is consistent with average investors' tax rates of less than 11 percent for non-energy income trusts and greater than 20 percent for energy trusts.

CONCLUSIONS

This article has explored the role of taxes in the valuation of common shares. In contrast to previous studies, we have employed a cross-sectional analysis to investigate the role of taxes in the common equity market owing to the presence of a unique hybrid security in Canada, the income trust. We have developed a new model to predict the effect of the two tax structures on the valuation of the underlying business, by combining the valuation model of Feltham and Ohlson with those from public economics. Our model predicts that earnings before taxes of a corporation, relative to an income trust, should be less valuable to investors, and the value should decrease as the income trust investors' tax rates fall.

86 See Edwards and Shevlin, supra note 6, at 473.

87 Canada, House of Commons Standing Committee on Finance, *Evidence*, 39th Parl., 1st sess., January 30, 2007.

88 Supra note 47, at 37.

89 We include an interaction with *C*, but the main effect is included in the industry dummies.

Using this model and data from 189 matched pairs of corporations and income trusts over the years 2002-2005, we estimate the pricing equation. We find that the coefficient on earnings is lower for corporations, consistent with the tax structure being important to the entity's valuation. Further, the coefficient suggests that the typical investor is not a high tax-rate individual. Taken together, the point estimates suggest that the average investor has a low tax rate, but point estimates should be interpreted with caution. Supplemental analysis shows that the pattern of coefficients for energy trusts and business trusts is consistent with the pattern of owner tax character. The ability to provide an estimate of the typical investor's tax rate is a significant and unique contribution, since it has been assumed to be zero in most previous studies.

The supporting archival evidence suggests that the model developed in this article could be a useful tool for future studies in deepening our understanding of the roles and interactions of entity-level and investor-level taxes on investment decisions and outcomes. Recent market occurrences, such as the encouragement for firms like Weyerhauser to convert to a REIT, actions by activist hedge funds to force conversions, and the introduction to the markets of novel organizational structures like those of Eagle Energy Trust and Parallel Energy Trust, suggest that taxes will continue to influence decisions in our markets.

While our research contributes to our understanding of this unique form of business activity, more importantly it contributes to a more universal understanding of the effect of investors' tax rates on market prices and investment choices. The cross-sectional setting allows our study to investigate the role of taxes in the valuation of equity more directly than previous studies and without the challenge of controlling for confounding economic events, as is the case for research primarily dependent on event studies. Our study thus provides new insights into the role of taxes while corroborating the findings of previous studies that lacked this unique setting.

APPENDIX A THE VALUATION EQUATION IN DISCRETE TIME

Poterba and Summers[90] assume that the firm's required cost of capital, ρ, is given by

$$\rho V_t = (1 - \tau_d)\, D_t + (1 - \tau_g)\, (V_{t+1} - V_t - S_t) \tag{A.1}$$

where

V_t = market value of the equity of the firm;
D_t = taxable dividends paid;
S_t = value of new shares issued; and
τ = tax rate on source (subscript d for dividends or subscript g for capital gains).

As in the text, in the equations that follow, the source to which τ applies is represented by k (unspecified) or by d, g, c (corporate income), or i (trust distributions).

This is equivalent to the continuous time expression in Auerbach.[91] Since this is an annual equation, it is clear that the capital gains tax rate, τ_g, is based on the annual accrued increases in value, rather than the realization of capital gains used by typical tax systems. As described in Poterba and Summers, equation A.1 is a difference equation that may be solved forward, subject to the transversality condition

$$\lim_{T \to \infty} \left(1 + \frac{\rho}{1 - \tau_g}\right)^{-T} V_T = 0 \tag{A.2}$$

to obtain the following valuation equation:

$$V_t = \sum_{j=t}^{\infty} \left(1 + \frac{\rho}{1 - \tau_g}\right)^{t-j} \left(\frac{1 - \tau_d}{1 - \tau_g} D_j - S_j\right). \tag{A.3}$$

Equation (A.3) is a tax-adjusted discounted dividends model where the required rate of return is adjusted for the investor's capital gains tax rate and the value of the dividends is adjusted for the so-called dividend tax penalty.

In the firm's efforts to maximize this value, it is subject to important constraints. Following Auerbach,[92] we model two constraints. First, dividends must be at least a minimum amount. Poterba and Summers use the constraint that dividends must exceed zero, but then must modify this approach to produce dividends under the traditional view of dividend taxation, where the dividend constraint binds. Auerbach

90 Supra note 11.

91 Supra note 13.

92 Ibid.

provides a simpler approach by constraining dividends to have a minimum payout ratio, γ,[93] as follows (translating the constraint into discrete time):

$$D_t \geq \gamma\,(D_t + V_{t+1} - V_t - S_t). \tag{A.4}$$

Second, net share issues are required to be greater than zero. Repurchases are acknowledged in both Poterba and Summers, and in Auerbach, but this literature argues that repurchases do not seem to replace dividends as a normal method of returning cash to shareholders even though repurchases are a much more tax-efficient method of doing so. Thus, following prior work, we assume

$$S_t \geq 0. \tag{A.5}$$

The firm's problem can be formulated as a maximization problem with multipliers λ on equation A.4 and μ on equation A.5 as follows:

$$V_t = \sum_{j=t}^{\infty}\left(1 + \frac{\rho}{1-\tau_g}\right)^{t-j}\left[\frac{1-\tau_d}{1-\tau_g}\,D_j - S_j + \lambda_j\Big((1-\gamma)D_j - \gamma\big(V_{j+1} - V_j - S_j\big)\Big) + \mu_j S_j\right]. \tag{A.6}$$

To simplify this expression in terms of V_t, we again solve the equation forward with an approach similar to that used to obtain equation A.3. This process yields the following equation

$$V_t = \sum_{j=t}^{\infty}\left(\prod_{k=t}^{j}\left(1 + \frac{\rho}{(1-\tau_g)(1-\lambda_k\gamma)}\right)\right)^{-1} \frac{1}{1-\lambda_j\gamma}\left[\left(\frac{1-\tau_d}{1-\tau_g} + \lambda_j(1-\gamma)\right)D_j + \big(\gamma\lambda_j + \mu_j - 1\big)S_j\right]. \tag{A.7}$$

Equation A.7 is a discrete-time analog to equation 2.8 in Auerbach.

For an income trust, the firm's required cost of capital, ρ, is modified to the following:

$$\rho V_t = (1-\tau_i)\,D_t + (1-\tau_g)\,(V_{t+1} - V_t - S_t). \tag{A.8}$$

However, we note that dividends are constrained to equal pre-tax income, X. Making this substitution, and solving forward as above, yields the following value equation:

$$V_t = \sum_{j=t}^{\infty}\left(1 + \frac{\rho}{1-\tau_g}\right)^{t-j}\left(\frac{1-\tau_i}{1-\tau_g}\,X_j - S_j\right). \tag{A.9}$$

For income trusts, the clean surplus relation can be substituted directly into equation A.9.

93 The required payout ratio is firm-specific and assumed to be exogenously determined.

APPENDIX B INCOME TRUSTS AS AN INVESTMENT VEHICLE: GOVERNANCE AND RISK

As discussed in the main text of the article, the income trust has become a popular investment vehicle in the Canadian equity market over the past decade, owing to its tax advantages and high payout rates. There are, however, certain governance and risk concerns that may have a bearing on the investment choice. The following provides a brief overview of those concerns and their implications for the further development of these structures.

Governance

Income trust securities, known as trust units, are traded on securities exchanges. They fall under the same securities exchange regulations as shares. Legally, corporations and trusts fall under different statutes. This has raised some concerns over governance of income trusts.[94] Most notably, income trust unitholders in some provinces were initially subject to unlimited liability. More recently, 90 percent of income trusts (100 percent of the study sample) reside in provinces that have updated these laws to provide unitholders with limited liability similar to that enjoyed by corporate shareholders. The rapid increase in the popularity of income trusts has left legislators scrambling to update governance laws with regard to trusts. Debate around the governance of trusts will likely continue as statutes evolve.[95] However, a recent study found that despite statutory differences, the governance activities of income trusts were comparable to those of corporations under guidelines set out by the Canadian Securities Administrators' National Policy.[96] Thus, the combination of securities regulations and scrutiny of the investment market may provide a check on trusts until the legislation formalizes the governance requirements.

Risk

The income from the trust structure is passed to unitholders in the form of monthly or quarterly distributions. These distributions are typically higher than stock dividends. The high frequency and rate of payouts have made income trusts attractive to many investors in the Canadian market, including retirees and pension funds. However, income trusts are an equity investment and not a fixed-income security. They share many of the risks inherent in stock ownership;[97] effectively, the trust unit is a bundle of equity and debt. Each trust has an underlying risk based on its underlying business. Potential differences in risk factors between the corporate and the income trust structure include the following:

94 Michael R. King, *Income Trusts: Understanding the Issues*, Bank of Canada Working Paper 2003-25 (Ottawa: Bank of Canada, September 2003).

95 Andy Hoffman, "Trusts Under the Spotlight," *Globe and Mail*, October 19, 2005.

96 SECOR Consulting, "Standards of Corporate Governance in the Income Fund Industry," 2006.

97 TD Waterhouse, "Income Trusts Coming Soon to S&P/TSX Composite," *Investors Insight*, July/August 2005.

1. *Lack of diversification*. Income trusts are generally concentrated in a single sector, unlike some corporations that are diversified across industries.
2. *Potential sacrifice of growth*. Because most revenue is passed on to unitholders rather than reinvested in the business, the trust's growth may be limited.
3. *Agency costs*. Because an income trust distributes most of its revenue and must go back to the market if it wants to raise capital for new projects, the trust may face different agency conflicts than many corporations.
4. *Exposure to regulatory change*. Owing to the potential loss of government tax revenue, the government may decide to intervene to remove some of the tax benefit.

Common Types

When trying to understand the risks of income trusts, it is important to consider the underlying investment assets. There are three main types of income trusts traded in the Canadian securities market: REITs, energy and resource trusts, and business trusts.

REITs

REITs are the original form of income trust. Their underlying investments are in income-producing properties. The REIT structure provides a structure for real estate investments similar to that of mutual funds for stock investments. Because of the unique characteristics of REITs and their lack of comparability to the underlying business of many corporations, they are not included in the study sample.

Energy and Resource Trusts

Energy and resource trusts have their underlying investment in energy or natural resources; therefore, the underlying risk is comparable to that for corporations operating in similar lines of business. The amount of distributions paid varies according to production levels, commodity prices, costs, expenses, and deductions. Unlike US energy trusts, Canadian energy trusts are able to reinvest in new properties.[98] Because of the underlying similarities between income trusts and corporations operating in these sectors, both energy trusts and resource-based trusts are included in the study, representing 39 percent and 12 percent, respectively, of the income trust sample.

Business Trusts

Business trusts are a relatively new entity and were the fastest-growing type of income trust in the market during the sample period. Business trusts are individual companies that have converted some or all of their equity into an income trust capital structure for tax reasons. These trusts now span practically all industries, including the manufacturing, services, and retail sectors. Although these income trusts are structured differently, their economic traits, such as risk, are similar to those of

98 "There's a BIG difference between Canadian and U.S. energy trusts. . . . In Canada, energy trusts are not much different from other companies": Carla Pasternak, "Profiting from Energy Trusts," *High-Yield Investing*, March 14, 2005.

corporations operating in the same sectors. Business trusts account for 49 percent of the income trust sample in the study.

APPENDIX C ILLUSTRATION OF THE INTEGRATION OF TAX RATES ON AFTER-TAX INVESTMENT IN CANADA

For investors with a one-year horizon, if the company and the investor reside in Ontario and all after-tax income is retained, a dollar of pre-tax earnings is taxed at 36 percent in the corporation. If the investor is an individual taxed at the top marginal rate (46 percent) and he receives a capital gain, the after-tax value to the investor is $0.493 for each dollar of pre-tax income of the corporation.[99] If the $0.64 of after-tax earnings is distributed as a dividend, rather than retained and ultimately taxed as a capital gain, the after-tax earnings are only $0.44.[100] However, if the business had been structured as an income trust, the after-tax value to the individual would have been $0.54, since the trust would pay no tax and the individual would pay tax at 46 percent on the full $1 received.

Table C.1 illustrates the after-tax value to an individual investor of a $1,000 investment for both organizational forms, for time horizons ranging from 1 to 10 years. In panel A, the assumed 20 percent pre-tax business return is earned entirely as taxable income to the corporation (which is distributed to the unitholders in the case of the trust). In panel B, the 20 percent pre-tax return is earned as 5 percent taxable income and 15 percent appreciation in value (for example, non-taxable creation of value through research and development activities). In panel A, the investor's tax rate is 46 percent, 25 percent, or 0 percent; in panel B, the rate is 46 percent or 0 percent.

For example, for an investor taxed at a 46 percent rate, if the income trust generates a $200 distribution in year 1, the investor pays $92 tax. The remaining $108 is reinvested, yielding a return of $222 in year 2. This requires a tax payment of $102, leaving $120. Thus, the investor has $1,228 after two years ($1,000 + $108 + $120). If the investment is in a corporation that pays no dividends, the corporation earns $200 pre-tax and $128 after the 36 percent corporate tax. The $1,128 is reinvested and earns $226 pre-tax and $144 after tax in year 2. The total investment is now worth $1,272. If sold, the corporate stock will yield a capital gain of $272, and the investor will pay $62 of tax at an effective rate of 23 percent (resulting from a 46 percent rate on one-half of the capital gain). The investor will then have $1,210 after tax. Thus, the corporate investment leaves the investor with $18 less after two years. Table C.1 shows that as the investment horizon increases, the effect of the tax on capital gains declines such that the corporate investment eventually produces a

99 Assuming that the remaining $0.64 is passed to the shareholder through appreciation, it is taxed at an effective rate of 23 percent (resulting from a 46 percent rate on one-half of the capital gain), or $0.147 more tax. Thus, the after-tax amount is $0.493.

100 The dividends are included at 125 percent, or $0.80, on the $0.64 of dividends. The tax on this income is at 46 percent, $0.368, less the dividend tax credit of $0.168, yielding a net investor tax of $0.20, or 31 percent, on the $0.64 dividend.

TABLE C.1 After-Tax Value of Investment to a Shareholder/Unitholder over Various Investment Horizons (in Canadian Dollars)

	1 year	2 years	5 years	10 years
Panel A: All income earned as taxable income				
After-tax accumulation at top individual tax rates (46%)				
Income trust	1,108	1,228	1,670	2,789
Corporation paying no dividends	1,099	1,210	1,636	2,798
Corporation paying 10% of net income as dividends each year	1,095	1,203	1,611	2,708
After-tax accumulation at low individual tax rates (25%)				
Income trust	1,150	1,323	2,011	4,046
Corporation paying no dividends	1,112	1,238	1,723	3,043
Corporation paying 10% of net income as dividends each year	1,111	1,237	1,718	3,027
After-tax accumulation at zero tax rate				
Income trust	1,200	1,440	2,488	6,192
Corporation paying no dividends	1,128	1,272	1,826	3,335
Corporation paying 10% of net income as dividends each year	1,128	1,272	1,826	3,335
Panel B: Income earned partly as taxable income and partly through capital appreciation				
After-tax accumulation at top individual tax rates (46%)				
Income trust	1,142	1,310	2,014	4,303
Corporation paying no dividends	1,140	1,306	2,007	4,329
After-tax accumulation at zero tax rate				
Income trust	1,200	1,440	2,488	6,192
Corporation paying no dividends	1,182	1,397	2,307	5,323

Notes: Calculations are based on the following assumptions. Values are based on a $1,000 investment. After-tax income that is distributed is reinvested in the same security; the pre-tax business return is 20 percent; retained earnings in the corporate form increase the value of the investment by the same amount and the investment is sold at the end of the time period; the corporation pays dividends as indicated. In panel A, all income is assumed to be earned as taxable income—no capital gains accrue to the income trust units. In panel B, the taxable income is assumed to be 5 percent of the investment with the remaining 15 percent being earned through capital appreciation, leading to a capital gain for all investments.

higher after-tax value. The payment of dividends reduces the after-tax value because dividends are more heavily taxed than capital gains, and the tax is paid annually rather than upon disposition. As the investor's tax rate declines, the corporate tax becomes more important to overall returns and the income trust structure becomes more favourable. To a tax-exempt investor, there is no tax paid on business earnings, and the investor receives the full 20 percent each year.

For growth businesses like those represented in panel B, the benefit of the income trust is substantially reduced, with little benefit accruing to the high-tax-rate investor over modest horizons and greater benefit to the corporate form over longer horizons. Exempt investors receive a higher return under the income trust structure, but the advantage is much less than when returns are earned through capital gains.