



Are financing constraints binding for investment? Evidence from a natural experiment

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<https://doi.org/10.1016/j.jebo.2020.06.029> 

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Abstract

This paper shows that the availability of cash flows dominates the effects of cost of capital for investment at the firm level. Using an exogenous tax reform in Canada as a quasi-natural experiment, I find that a temporary and unexpected increase in the cost of capital for firms with low availability of retained earnings has no effect on investment of those firms. A subsequent direct increase in the availability of cash flows has large effects on investment. This suggests that internal financing constraints are binding for firms, as they prefer to use low cost retained earnings to finance their investment.

Introduction

The question of how taxes affect investment has been extensively analysed in the economic literature. It is relevant for policy design, especially in the context of designing tax reforms that aim to encourage growth. Through the analysis of various tax policies, the economic literature assesses the effects of taxation on investment.² It is crucial to understand whether the effects of tax policies on investment are transmitted through changes in the cost of capital or through cash flow effects or both. Identifying which types of tax reforms affect which types of firms will help design a more targeted set of tax policies.

This paper provides novel evidence on the relative importance of cash flows and cost of capital. I use an exogenous tax reform in Canada as a quasi-natural experiment in a difference-in-difference setting. I consider a temporary and unexpected increase in the cost of capital for firms with low availability of retained earnings. I compare them to firms with similar characteristics that did not face the same financing constraints and were not subject to the tax reform. I find no effect of the tax reform on investment of firms with low availability of retained earnings. In turn, a subsequent large direct increase in their cash flows availability has large effects on investment, in spite of an increase in their cost of capital. This suggests that

internal financing constraints may be binding for firms, as they prefer to use low cost retained earnings to finance their investment.

The empirical analysis takes advantage of a particular reform in Canada, which applied to a specific group of firms - income trusts - without affecting traditional Canadian corporations. In Canada, income trusts were publicly traded companies that were not dissimilar to traditional corporations. In fact, some income trusts were previously publicly traded corporations before they decided to assume an income trust structure, primarily for tax saving purposes. Income trusts were two-layer Canadian flow-through entities that were not taxed at the trust level, if they distributed all their cash flows. They consisted of an income trust and an operating company. The unitholders of income trusts were taxed on the distributions made at their marginal income tax rates. The popularity of the income trust structure can be attributed to two distinct tax advantages. The first one is the ability to decrease corporate income tax at the operating company level due to facilitating higher leverage, the second one is lower total tax on distributed profits for ultimate owners. Earnings, which might otherwise have been retained and used as a low cost source of finance for investment, were eliminated (by higher related-party debt) at the operating company level; the corresponding interest income received by the trust could not be retained (at the trust level) without foregoing the tax advantage. Therefore on one hand an income trust had a lower cost of capital for all sources of financing due to elimination of corporation tax, but on the other hand to achieve this tax saving it had to rely more on the more expensive external sources to finance its investment.

To investigate the causal effects of changes in cost of capital and cash flows on investment I use an exogenous tax reform in Canada, which was announced in October 2006. The tax privileges of income trusts were to be revoked from January 2011. This meant that in 2011, there would no longer be a tax saving associated with being an income trust and there would no longer be a tax advantage from distributing all profits to unitholders. Income trusts were to be taxed on their income at a standard corporation tax rate whether they distributed it or not. As a result most of them converted to traditional corporate structures and reduced their dividend payout ratios. A transitional grandfathering period was introduced for the years between 2006–2010, during which income trusts were allowed to exist on previous terms, but could also convert to corporate structure prematurely without any further tax penalties.

The 2006 reform announcement led to the anticipation of higher corporation tax payments in 2011, or after the trust chose to convert to corporate form, than at the time the investment was made (and the initial investment allowances were claimed). For instance, for an investment that began in 2007, income trusts would have received little benefit from capital allowances on the initial investment claimed against a zero corporation tax rate. However, they would have to pay tax on the eventual return at a relatively high corporate tax rate. This expectation of a higher corporate tax rate in the future resulted in a temporary increase in the cost of capital following the 2006 reform announcement for any source of financing. In the neoclassical framework, an increase in the cost of capital tends to reduce investment (Jorgensen, 1963, Hall, Jorgensen, 1967, Tobin, 1969). The general agreement is that the estimated elasticity of the capital stock to the user cost of capital ranges between -0.25 and -1. This literature is vast and still very active with most recent contributions coming from analysing the effects of bonus depreciation in the US. Zwick and Mahon (2017) and House and Shapiro (2008) use the quasi-experimental variation in cost of capital offered by the bonus depreciation and find large investment responses. In related work, using the quasi-experimental variation created by Domestic Production Activities Deduction, Ohn (2018) shows that one percentage point reduction in tax rates increases investment by 4.7 percent.

Contrary to the predictions of the neoclassical model, I find that the 2006 reform announcement had no robust effect on investment so long as firms remained in the income trusts structure, i.e. as long as they

distributed most of their profits and retained only a small portion of their earnings. This suggests that for firms with limited cash flows, financing constraints may be binding and hence those firms may be less responsive to investment (dis)incentives, such as an increase in the cost of capital, than they would be in the neoclassical model. This finding is related to previous work by Doidge and Dyck (2015) who use the 2006 reform announcement to consider its effects on various firm level characteristics. They find robust positive effects of the reform announcement on investment. The results presented in this paper are broadly consistent with their findings, as I also show positive effects across specifications. However, the statistical significance of these coefficients depends on the set of controls and fixed effects that are used.

The novel contribution of this paper is in analysing the subsequent effects of the 2006 tax reform. At the expiry of the income tax privileges, in 2011, the reform exerted a direct effect on retained earnings and corporate cash flows. This occurred because the incentive to distribute income was reduced for income trusts then. I find that after 2010 income trusts have significantly increased their investment rates relative to corporations. This happened, in spite of the fact that their cost of capital was higher in 2011 than in 2006, before the reform announcement. The expiry of tax privileges and the associated increase in the availability of cash flows at the firm level are more important for investment decisions of firms than changes in the cost of capital when the firm has low retained earnings. This friction between increased cost of capital and increased availability of cash flows for the affected firms allows for a new perspective on what drives firms' investment. The direct effect of the cash flow availability at the firm level dominates the effects of the cost of capital. Hence, adding to the earlier work by Doidge and Dyck (2015), I show the relevance of financing constraints for firm investment decisions over other margins.

I present two additional descriptive pieces of evidence to support the binding nature of the availability of low cost financing. First, I find that the increase in the investment rates of income trusts following the implementation of the reform in 2011 is permanent. Second, I show that changes in the investment rates of income trusts in 2011 are primarily driven by income trusts that were more likely to be financially constrained. I use three different proxies for financing constraints: firm size, credit ratings and whether firms were distributing below or above median ratios of dividends to total assets in 2011. An increased availability of cash flows at the firm level, which was the result of conversion to corporate structure, only had effects on the investment of firms that were more likely to be financially constrained. This is in line with the fact that financially unconstrained firms would not need to rely on retained earnings to finance their investment, but could more easily use external sources.

These findings put the paper in line with the large existing empirical literature on the link between financial constraints, cash flow and corporate investments. This literature stresses the importance of the improved access to internal finance and the availability of after-tax cash flows for investment (Fazzari, Hubbard, Petersen, 1988, Gertler, Hubbard, 1988 and Fazzari, Petersen, 1993, Alti, 2003). In particular, related to this paper are studies that link the investment - cash flow sensitivities to financing constraints.

Fazzari et al. (1988) find that firms facing financing constraints should have high investment- cash flow sensitivities. This argument is related to the fact that the cost of external sources of financing such as debt and new equity has been found to be higher than that of internal sources of financing such as retained earnings (Fazzari, Hubbard, Petersen, 1988, Bond, Meghir, 1994, Calomiris, Hubbard, 1995 and Hennessy and Whited, 2007) The literature offers various explanations for why internal sources of financing may be less costly than new share issues and debt financing. Among the most important ones are transaction costs, tax advantages, agency problems, costs of financial distress and asymmetric information. However, there has also been a discussion on how we can identify financially constrained firms. Farre-Mensa and Ljungqvist (2015) provide an overview on how firms that are typically classified as constrained do not

actually behave as if they were constrained. This is consistent with evidence from Kaplan and Zingales (1997), who show that investment-cash flow sensitivities cannot be used to measure financial constraints. Findings from the present paper support recent contributions from the empirical literature on the effects of limited cash flow on investment incentives. Financing constraints may dampen the response to tax incentives as summarised by the tax-adjusted cost of capital or tax-adjusted q ratio (Edgerton, 2010); but may amplify the response of investment to tax changes which leave firms with additional post-tax income, as well as lowering their cost of capital (Zwick and Mahon, 2017). This paper adds to this new and growing literature by providing new evidence that a limited availability of retained earnings at the firm level may not only dampen the response of investment to tax (dis)incentives, but also completely dominate it, if the firm is financially constrained.

The rest of the paper is organised as follows. Section 2 gives an overview of the Canadian income trusts structure and their tax treatment in more detail, Section 3 illustrates the changes in the cost of capital, Section 4 describes the data, Section 5 presents a simple empirical model, while Section 6 reports the empirical results. Section 7 concludes.

Section snippets

Canadian Income Trusts

The income trusts structure consists of two main entities - an income trust and an operating company. An income trust is a publicly traded firm which uses the proceeds from the public offering to acquire subordinated debt and common shares of the operating company. These notes owned by the income trust are long-term unsecured high-yield debt. In reality this internal debt plays the role of a tax-advantaged form of equity. It was used by the income trust to minimise the taxable income of the...

Cost of capital

In this section I illustrate the effects of the tax reform announcement on the cost of capital for income trusts. I consider a value-maximising income trust which invests in period 1. I assume that income from that investment is taxed and variable costs are fully tax-deductible. I further assume that this income trust does not convert back to corporate form until the expiry of its tax privileges in 2011. I also assume, for simplicity, that the shareholder is a pension fund, hence it is exempt...

Data sources description

In the empirical analysis I use the sample of 270 Canadian income trusts that comes from a list of income trusts traded on the Toronto Stock Exchange (TSX) at the end of October 2006. To obtain detailed information about each income trust I manually collect a novel dataset from [SEDAR](#). SEDAR offers access to most public securities documents and information filed by public companies in Canada, such as for instance initial public offering (IPO) documents and material change documents which enable...

Empirical model

To estimate the effects of the 2006 income trusts tax reform on investment rates I use the exogenous shock created by the announcement of the 2006 reform (see Fig.8 for the unanticipated drop in the market value of income trusts relative to corporations following the announcement).²²...

Baseline estimates

Table 1 presents results from estimating the model described above. Columns 1 and 2 use the full sample of corporations as a control group, columns 3 and 4 implement one to one PSM, while columns 5 and 6 use kernel matching. Columns 1, 3 and 5 use year and industry-year fixed effects, to show how investment rates of income trusts changed after the 2006 reform relative to investment rates of corporations from the same sector. Columns 2, 4 and 6 present results with firm, year and industry-year...

Conclusion

In this paper I have shown that investment does not respond to changes in the cost of capital in a situation when firms have limited access to cash flows. In turn, changes in the availability of low cost internal financing have large effects on investment. I show that an increase in the availability of retained earnings for (former) income trusts in Canada following the implementation of a tax reform in 2011 resulted in an increase in their investment rate, in spite of a concurrent increase in...

Declaration of Competing Interest

The author declares that she has no relevant or material financial interests that relate to the research described in this paper...

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- 1 I would like to thank Steve Bond and Mike Devereux for their extensive comments. Further thanks to Simon Quinn, Johannes Abeler, Brian Bell and participants of the Ce2 Workshop, ZEW Public Finance conference for their suggestions on the earlier drafts of this paper. The author is also thankful for the support from the Peter G. Peterson Foundation for a postdoctoral fellowship on long-term fiscal policy at NBER during which part of this research has been conducted.

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