The kinky response of corporate taxable income to dividend taxation

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Abstract

We provide the first empirical estimates quantifying the relative distortionary effects of corporate and dividend taxes, finding that the ratio of firms' taxable income elasticities with respect to the net-of-tax rates on dividends and corporate income is 0.296. To interpret this estimate, we develop a theoretical model with bunching in which firms follow either the old or the new view of dividend taxation, such that the elasticity ratio identifies the share of bunching firms that behave according to the old view in the overlapping bunching region. For identification, we extend the classical bunching framework by allowing for multiple kinks at the same threshold, enabling us to estimate corporate taxable income elasticities with respect to both dividend and corporate tax rates. Our paper leverages a unique tax reform introduced in Canada in 2006, which targeted Canadian-controlled private corporations. This reform increased the integration between corporate and dividend taxes by allowing a larger share of corporate tax payments to be credited against dividend taxes, thereby reducing the effective dividend tax rate. Using our empirical estimates, we compare the efficiency gains from increasing dividend-tax integration to those from reducing the corporate tax rate. Our results suggest that, under the studied reform, reducing the corporate tax rate is more efficient, as reducing the dividend tax rate in one percentage point through increased tax integration recovers only one-quarter of the efficiency loss associated with corporate taxation.

Keywords: Bunching estimation, Corporate taxation, Dividend taxation, Elasticity of taxable income, Small businesses, Tax integration.

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1 Introduction

Governments rely on a variety of tax instruments to generate revenue, including personal income taxes, corporate taxes, dividend taxes, and capital gains taxes. The choice among these instruments is shaped by two key considerations: (i) the distributive impact of selecting a particular tax base, and (ii) the behavioral responses triggered by changes in tax rates. When governments seek to foster economic growth through tax reductions, they are particularly concerned with minimizing the use of instruments that significantly distort economic behavior.

A case in point is the 2006 Canadian tax reform, which reduced the effective dividend tax rate for Canadian-Controlled Private Corporations (CCPCs). The government justified this measure by arguing that "reducing the tax individuals pay on dividends will encourage savings and investment".[1] Notably, this tax reduction formed part of the broader *Plan for Growth and Prosperity*, which aimed to raise the standard of living for all Canadians.[2]

This policy also highlights a broader issue at the core of the corporate taxation debate: the "double taxation" of corporate income, whereby profits are taxed first at the corporate level and again at the personal level when distributed as dividends. This longstanding concern raises the central policy question of which level of taxation should be reduced to most effectively stimulate economic growth.

The debate surrounding this question has centered around two competing views of dividend taxation. According to the "old view" (Feldstein, 1970; Harberger, 1962; Poterba and Summers, 1983), firms finance marginal investment by issuing new equity. Under this framework, both corporate and dividend taxes reduce the after-tax return to shareholders in a symmetric way and are therefore equally distortionary. Higher corporate taxes, in this paradigm, lead to lower investment and lower taxable profits.

In contrast, the "new view" holds that firms effectively ignore personal taxes when choosing investment projects — a phenomenon often described as the presence of a "corporate veil" (Bustos et al., 2004). This perspective assumes that firms finance marginal investment using retained earnings. In such a setting, a reduction in dividend taxes increases the return to shareholders but has no effect on the marginal return to investment, rendering

[1] Finance Minister Ralph Goodale, who was part of Prime Minister Paul Martins Liberal administration, 2005.

[2] The policy was introduced by the Liberal government but retained and expanded by the Conservative government elected in early 2006 under Stephen Harper.

dividend taxes neutral with respect to investment decisions (Auerbach, 1979; Bradford, 1981; King, 1977). Consequently, under the new view, although corporate taxes are distortionary, dividend taxes do not affect investment behavior and therefore do not reduce taxable profits.

This paper contributes to the long-standing debate on dividend taxation by presenting the first empirical estimates that quantify the relative distortionary impact of corporate and dividend taxes. We estimate the elasticity of corporate taxable income (ECTI) with respect to both the corporate and dividend net-of-tax rates. Crucially, both elasticities are identified at the same kink point in the taxable income distribution, enabling a direct comparison of behavioral responses to each tax instrument. Our identification strategy exploits the 2006 Canadian dividend tax reform, which reduced the marginal effective tax rate on dividends paid out of corporate income earned by CCPCs above the 300,000 CAD threshold.[3]

Although several papers have estimated the ECTI with respect to the corporate net-of-tax rate (Bachas and Soto, 2021; Boonzaaier et al., 2019; Coles et al., 2021; Devereux et al., 2014; Lediga et al., 2019; Lobel et al., 2021), to the best of our knowledge, this is the first paper to estimate the ECTI with respect to the dividend net-of-tax rate. Our estimates, which are precise and robust to a range of sensitivity checks, suggest that the ECTI with respect to the corporate net-of-tax rate is 0.843 (s.e 0.02), while the dividend ECTI is 0.249 (s.e 0.035).[4] This implies that the distortionary effect of dividend taxes, relative to corporate taxes, is 0.296 (s.e 0.046), as implied by the ratio of the elasticities.

To rationalize our findings, we develop a novel bunching framework that extends the canonical approach of Saez (2010) and Chetty et al. (2011), originally applied to labor supply responses, to the case of firms subject to double taxation. Specifically, we propose a model in which firms are behaviorally heterogeneous: a share follows the old view, while the remainder portion adopts the new view. The model features a double kink in a common threshold, generating changes in marginal rates in both the corporate and dividend tax schedules. This framework enables the identification of both elasticities using the 2006 dividend tax reform.

[3]Recent papers that study CCPCs in the context of tax reforms include Duan and Moon (2024*a*), Duan and Moon (2024*b*).

[4]These estimates align with the findings from Bernier and Perrault (2023), who report that the ECTI with respect to the corporate net-of-tax varies from 0.26 in New Brunswick to 1.43 in Alberta, with a median value of 0.79 for CCPCs at the $500,000 threshold between 2010 and 2017.

Our identification strategy leverages two particular features of the Canadian tax system and the dividend tax reform. First, prior to the 2006 tax reform, only the corporate tax schedule featured a kink at the 300,000 CAD threshold, allowing for the estimation of the corporate ECTI using standard bunching methods. Second, the 2006 reform introduced a new kink in the dividend tax schedule at the same threshold, while leaving the corporate kink unchanged. This policy design enables us to isolate the impact of the change in dividend taxation by attributing any differential change in bunching at the threshold to the reform, thereby identifying the dividend ECTI. To the best of our knowledge, this is the first paper to extend the bunching estimator to the context of firms subject to double taxation.

Our framework also yields a structural interpretation of the ratio of the two ECTIs: it captures the local share of old view firms within the overlapping bunching region where both old and new view firms respond. In this sense, the relative distortionary impact of dividend versus corporate taxation provides a direct test of the extent to which firms behave according to the old view. That is, the ratio of elasticities provides a sharp empirical test of "old view" behavior at a given point in the corporate taxable income distribution. Since our estimate of this ratio is statistically different from both zero and one, we reject the hypothesis that a single type of firm behavior prevails at the threshold. Accordingly, neither the old view nor the new view alone can fully account for firms' responses to changes in the dividend tax rate.

Institutionally, the 2006 Canadian reform reduced the effective dividend tax rate by enhancing the degree of integration between corporate and personal taxation. In essence, tax integration refers to systems designed to ensure that corporate income is taxed only once, either at the corporate level or the personal level, rather than being taxed twice when distributed as dividends. A common mechanism is the imputation credit system, which has been adopted in countries such as Canada, Australia, and the United Kingdom. Under this system, shareholders receive a credit for taxes already paid at the corporate level, offsetting their personal tax liability on dividends and thereby eliminating double taxation. In the Canadian case, the reform increased integration by enhancing the dividend tax credit for income distributed from corporate profits above the $300,000 threshold, effectively lowering the marginal tax wedge on those distributions.

Globally, mitigating double taxation through tax integration has been a longstanding policy objective. Many countries have adopted integration mechanisms — such as dividend tax credits, gross-up systems, or shareholder imputation schemes — to reduce distortions in capital allocation and firm behavior. Notably, the 2003 US tax reform sharply reduced the tax rate on qualified dividends, explicitly motivated by concerns about double taxation and its impact on investment incentives and corporate payout behavior. These policy choices reflect a longstanding discussion on the potential efficiency costs of taxing corporate income twice (Hubbard, 1993, 2005; U.S. Department of the Treasury, 1992). Despite the theoretical appeal and widespread international adoption of integration schemes, however, empirical evidence on their efficiency implications remains scarce.

This paper contributes to closing that gap by providing the first empirical estimates of the marginal excess burden associated with integrated corporate-dividend tax systems. Using a novel double-kink setting and estimated elasticities, we quantify the relative efficiency costs of corporate and dividend taxation, following the sufficient statistic approach of Devereux et al. (2014) and Saez et al. (2012). Our findings indicate that raising revenue through corporate taxes is roughly four times more distortionary than through an increase of effective dividend taxes via a decrease in the integration rate between the corporate and the dividend tax rates. This suggests that the 2006 Canadian reform, while increasing integration, generated only modest efficiency gains and disproportionately benefited higher-income individuals, consistent with recent distributional critiques of dividend tax policy (Smart, 2017). More broadly, our results underscore the economic effects of tax integration reforms in shaping both the efficiency and equity of corporate tax systems.

Related literature

Our paper contributes to five strands of the public finance literature. First and foremost, it contributes to the empirical literature on dividend taxation. While theoretical interest in this area is long-standing, empirical work on the effects of dividend taxes on firm behavior is relatively recent. The 2003 dividend tax reform in the United States sparked a wave of research, with numerous studies examining its impact on various firm-level outcomes — such as dividend payouts investment behavior (Chetty and Saez, 2005; Edgerton, 2013; Isakov et al., 2021; Kontoghiorghes, 2024; Matray, 2022; Yagan, 2015). However, to the best of our knowledge, the relationship between dividend taxes and corporate taxable income remains largely unexplored.

Second, our paper contributes to the empirical literature on corporate taxation. A large body of work has studied firm responses to corporate taxes across margins such as investment (Caballero and Engel, 1999) and financing (Graham, 2003). More recently, research has shifted toward estimating the ECTI with respect to the corporate tax rate (Bachas and Soto, 2021; Boonzaaier et al., 2019; Coles et al., 2021; Devereux et al., 2014; Lediga et al., 2019; Lobel et al., 2021). This elasticity has been proposed as a "sufficient statistic" for welfare analysis (Devereux et al., 2014; Feldstein, 1999), as it captures a range of firm responses to taxation —including income shifting, tax avoidance, and real behavioral changes. Building on this literature, a key contribution of our paper is to estimate the ECTI with respect to both corporate and dividend tax rates, providing the first empirical evidence on the relative distortionary effects of each instrument.

Third, our work contributes to the theoretical literature on corporate and dividend taxation, particularly the debate between the old and new views of dividend taxation (Auerbach, 1979; Bradford, 1981; Feldstein, 1970; Ghilardi and Zilberman, 2024; Hall and Jorgenson, 1967; Harberger, 1962; King, 1977; Poterba and Summers, 1983). Rather than aligning fully with either perspective, our results reflect partial piercing of the corporate veil, consistent with an extended version of the model developed by Chetty and Saez (2010). We build on this framework by incorporating a kink in both the corporate and dividend tax schedules, allowing us to separately identify behavioral responses to each tax instrument. Notably, the model accommodates heterogeneous firm types, leading to a taxable income distribution that reflects a mix of old view and new view firms. This heterogeneity, combined with the double kink structure, gives rise to differential aggregate responses of taxable income to each tax.

Fourth, we contribute to the literature on the bunching estimator by extending the framework to firms subject to double taxation. Specifically, we extend the seminal bunching model of Saez (2010), originally developed in the context of personal taxes and labor supply, to the corporate setting. Recently, the bunching literature has experienced substantial developments concerning the assumptions required for identification (Bertanha et al., 2023; Blomquist et al., 2021). In light of this, we explicitly state the identifying assumptions necessary for estimating both elasticities. Our approach aligns with the growing literature on firm bunching behavior (Coles et al., 2021), while also incorporating insights from the dividend tax literature (Chetty and Saez, 2010) to account for firms' differential responses to corporate and dividend tax rates. Moreover, our framework yields a structural interpretation of the relative distortion caused by each tax: under our model, the ratio of elasticities naturally corresponds to the local share of old view firms at the kink.

Finally, our paper relates to the literature on double taxation and tax integration. It is often argued that double taxation may create incentives for tax sheltering and planning strategies that divert resources away from productive activities (Agostini et al., 2018; Hubbard, 1993; Slemrod and Bakija, 2004). To address these inefficiencies, many countries have implemented tax integration mechanisms aimed at taxing corporate income only once. Indeed, the economic rationale for integration has featured prominently in U.S. policy discussions. For instance, the 1992 U.S. Treasury Report titled "Integration of the Individual and Corporate Tax Systems" laid out a framework for aligning corporate and personal taxation (Hubbard, 1993, 2005; U.S. Department of the Treasury, 1992). These ideas informed the 2003 U.S. tax reform, which sought to reduce investor-level taxes on dividends and allowed basis adjustments for retained earnings. These reforms had wide-reaching effects: the use of pass-through entities such as S-corporations expanded, and the share of taxable corporate equity fell from 80% to 30% (Burman et al., 2017). The dividend tax rate was also substantially reduced, further decreasing the burden of double taxation (Chetty and Saez, 2005; Yagan, 2015). Our contribution lies in offering the first empirical estimates of how increased integration between corporate and personal taxes affects economic efficiency.

This paper proceeds as follows: Section 2 discusses how investment and corporate taxable income respond to corporate and dividend taxes under the old and new view, Section 3 develops the model and econometric framework. Section 4 describes the institutional background. Section 5 describes the data and estimation strategy. Section 6 reports the results. Section 7 discusses the policy implications of increased integration. Section 8 concludes the paper.

2 Dividend tax vs corporate tax ETI: the corporate veil revisited

2.1 A review of corporate taxable income, dividend and corporate taxes

In their seminal work, Hall and Jorgenson (1967) introduced the concept of the user cost of capital, which represents the implicit cost incurred by firms to employ an additional unit of capital. Under this framework, higher corporate taxes raise the user cost of capital, reducing the net return on investment and discouraging capital accumulation. As firms scale back investment, the expansion of their capital stock slows. Since investment is a key driver of long-term profitability, this contraction in capital accumulation reduces firms ability to generate taxable earnings, thereby shrinking the corporate tax base.

In this context, the elasticity of corporate taxable income with respect to the net-of-tax corporate rate has emerged as a key metric for quantifying firms' behavioral responses to taxation. Formally, this elasticity is defined as:

$$\epsilon_{1-\tau_c}(\pi) = \frac{\partial \pi}{\partial (1-\tau_c)} \frac{(1-\tau_c)}{\pi}, \tag{1}$$

where π denotes taxable corporate profits, τ_c is the corporate tax rate. This elasticity measures the percentage change in taxable corporate profits in response to a 1% increase in the corporate net-of-tax rate. Concretely, theory predicts a positive $\epsilon_{1-\tau_c}(\pi)$, which implies a negative relationship between corporate taxable income and the magnitude of corporate taxes.

Despite the theoretical consensus on the effect of corporate taxes on firm behavior, the discussion regarding the effects of dividend taxes remains much more divisive. Specifically, much of the literature has revolved around the debate between the "old view" and the "new view" of dividend taxation. Under the old view (Harberger, 1962; Poterba and Summers, 1985), firms finance investment through equity. Consequently, dividend taxes reduce the after-tax return to shareholders, effectively increasing the user cost of capital. Thus, the old view suggests that dividend taxes distort investment behavior in the same way as corporate taxes. Building on Chetty and Saez (2010), this implies that both the elasticities with respect to the corporate net-of-tax rate and with respect to the dividend net-of-tax rate must be equal:

$$\epsilon_{1-\tau_c}(\pi) = \epsilon_{1-\tau_d}(\pi), \tag{2}$$

where τ_d is the dividend tax rate. Contrarily, the new view (Auerbach, 1979; Bradford, 1981; King, 1974, 1977) suggests that firms finance investment through retained earnings. As such, this perspective implies the presence of a *corporate veil*: changes in dividend taxes do not affect the user cost of capital, suggesting that firms ignore the personal taxes paid by shareholders when making investment decisions (Bustos et al., 2004). Thus, under the new view, dividend taxes have no effect over the corporate tax base (Chetty and Saez, 2010):

$$\epsilon_{1-\tau_d}(\pi) = 0. \tag{3}$$

2.2 The corporate veil index

Although the old and new views of dividend taxation have been a staple of the literature, there are reasons to believe that, on aggregate, dividend taxes do influence investment decisions, albeit to a lesser extent than corporate taxes, resulting in a corporate veil that is neither completely impermeable nor fully pierced. For instance, some researchers propose a life-cycle view of the firm, where young firms rely more on external financing, while mature firms depend primarily on retained earnings (Erosa and González, 2019; Korinek and Stiglitz, 2009; Sinn, 1991). Similarly, Chetty and Saez (2010) present a simple model in which firms behave according to the old or new view depending on their levels of retained earnings. Under these frameworks, a combination of both old and new view firms may coexist at a given income level π. Thus, dividend taxation may have a smaller aggregate effect than corporate taxation, yielding a lower aggregate elasticity with respect to dividend taxes.

These perspectives motivate the need for a quantitative measure of the extent to which dividend taxes influence corporate behavior relative to corporate taxes. To formalize this idea, we introduce the corporate veil index, denoted by θ. This index is defined as the ratio of the ECTI with respect to the dividend net-of-tax rate to the elasticity with respect to the corporate net-of-tax rate:

$$\theta(\pi) = \frac{\epsilon_{1-\tau_d}(\pi)}{\epsilon_{1-\tau_c}(\pi)}. \tag{4}$$

A value of $\theta = 0$ corresponds to complete corporate veiling, where firms entirely ignore dividend taxation (consistent with the new view). A value of $\theta = 1$ implies no veiling, where dividend and corporate taxes distort behavior equally (as in the old view). Intermediate values suggest partial veil piercing, indicating that firms account for dividend taxes, but to a lesser extent than corporate taxes. In this case, both old and new view firms may coexist.

Importantly, both elasticities may vary substantially across levels of taxable income. For example, Devereux et al. (2014) estimate an elasticity between 0.132 and 0.167 for British firms near the £300,000 kink, but find significantly higher elasticities (0.366 to 0.556) around the £10,000 kink. This suggests that smaller firms exhibit stronger behavioral responses to taxation. Although empirical estimates of dividend tax elasticities remain scarce, similar heterogeneity is likely to apply. This variation underscores the importance of measuring both elasticities at the same income level π when constructing the corporate veil index, to ensure comparability and internal consistency.

Moreover, $\theta(\pi)$ has a natural interpretation under a simple heterogeneity assumption. Suppose that, at income level π, a share $\theta(\pi)$ of firms behave in line with the old view, while the remaining share, $1-\theta(\pi)$, follow the new view. Further, assume that elasticities are homogeneous across firms.

Since all firms respond to corporate taxes, the average elasticity with respect to the corporate net-of-tax rate is given by $\epsilon_{1-\tau_c}(\pi)$. However, only firms following the old view respond to dividend taxes, implying:

$$\epsilon_{1-\tau_d}(\pi) = \theta(\pi) \cdot \epsilon_{1-\tau_c}(\pi) + (1-\theta(\pi)) \cdot 0 = \theta(\pi) \cdot \epsilon_{1-\tau_c}(\pi). \quad (5)$$

Therefore, under this assumption, $\theta(\pi)$ corresponds to the local share of old view firms at income level π. A higher value of $\theta(\pi)$ indicates a greater prevalence of firms that are fully responsive to dividend taxes, providing a direct test of the empirical relevance of the old and new views of corporate behavior.

In the next section, we develop a microfounded model in which θ emerges naturally under a bunching framework, and propose an econometric strategy for estimating both elasticities, and the corporate veil index, from observed bunching patterns.

3 ECTI identification using bunching under multiple taxation

We illustrate the previous discussion with a simple model that nests both the old and new views of dividend taxation, taken directly from Chetty and Saez (2010). We then develop a model in the scenario in which there is a kink in the corporate and dividend tax schedules, aiming to establish a bunching framework that allows us to estimate both elasticities from two observed bunching moments. We outline the specific identifying assumptions, thereby extending the seminal bunching framework of Saez (2010) to the case of firms facing double taxation.

3.1 Baseline model

In the baseline model, firms begin period 0 with initial retained earnings X from past operations. They can raise additional equity E in the same period. The manager can either distribute dividends D, which are subject to a dividend tax τ_d, or invest the remaining funds in a project that generates net profits $f(I)$ in the following period, where investment evolves as $I = X + E - D$. These profits are subject to a corporate tax rate τ_c.

In period 1, the firm closes, distributing its profits, again subject to the dividend tax, and returning the tax-exempt principal investment to shareholders. The model further assumes that investors can alternatively invest in government bonds that pay a fixed, untaxed interest rate $r > 0$. We abstract from potential agency problems by assuming that the manager's objective is to maximize the firm's value, which is given by

$$\max_{\{E,D\}} V = (1-\tau_d)D - E + \frac{(1-\tau_d)[(1-\tau_c)f(X+E-D) + X - D] + E}{1+r} \tag{6}$$

Finally, we assume that firms employ a isoleastic net profits function:

$$f(I) = A\left(\frac{1+\epsilon}{\epsilon}\right) I^{\frac{\epsilon}{\epsilon+1}} \tag{7}$$

where A is a productivity parameter, and ϵ is a structural elasticity parameter. $f(I)$ also corresponds to the corporate taxable income (in current value) of the firm. Given this, we define $\pi_j \equiv F(I_j^*)$ as the optimal level of taxable income chosen by the firm, where $j = \{\text{n}, \text{o}\}$ indexes new or old view firms.

New view firms

We first characterize the behavior of new view firms, which are rich in initial retained earnings: $f'(X) < \frac{r}{1-\tau_c}$. First, note that if a firm issues new equity and pays dividends, it can strictly increase its value by reducing both equity issuance and distributions, thereby lowering its tax bill by $\frac{\tau_d r}{1+r}$. Additionally, since the marginal after-tax return on investment is less than the risk-free interest rate, these firms will not issue equity ($E = 0$). Instead, they will fully finance investment through internal capital, and so their optimal choice of taxable income is given by:

$$\pi_{\text{n}} = A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_c)^{\epsilon}$$

This result implies the following elasticities for new view firms:

$$\epsilon^{\text{n}}_{1-\tau_c} = \frac{\partial \log \pi_{\text{n}}}{\partial \log(1-\tau_c)} = \epsilon, \quad \epsilon^{\text{n}}_{1-\tau_d} = \frac{\partial \log \pi_{\text{n}}}{\partial \log(1-\tau_d)} = 0$$

Thus, under the new view, dividend taxes do not affect taxable income (as they do not distort investment incentives). Corporate taxes, however, still affect taxable income.

Old view firms

We now consider the case of old view firms, which are constrained by their initial stock of capital: $f'(X) > \frac{r}{1-\tau_c}$. Since the marginal after-tax return on investment exceeds the interest rate, the marginal value of paying dividends when $E = 0$ is negative. Consequently, these firms do not pay dividends and instead issue equity to finance investment, resulting in the following choice of taxable income:

$$\pi_{\text{o}} = A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_c)^{\epsilon}(1-\tau_d)^{\epsilon}.$$

Thus, for old view firms both taxes distort taxable income (and investment behavior) in the same way:

$$\epsilon^{\text{o}}_{1-\tau_c} = \frac{\partial \log \pi_{\text{o}}}{\partial \log(1-\tau_c)} = \epsilon, \quad \epsilon^{\text{o}}_{1-\tau_d} = \frac{\partial \log \pi_{\text{o}}}{\partial \log(1-\tau_d)} = \epsilon.$$

3.2 Model with a kink and bunching identification

We now develop a model that introduces a kink in the corporate tax schedule which simultaneously affects corporate and dividend taxes. This extension serves two main purposes. First, it allows us to capture the 2006 Canadian tax reform, which introduced a kink in the dividend tax schedule by lowering the effective dividend tax rate on dividends paid from taxable profits above a threshold of 300,000 CAD. Second, it enables us to relate the bunching mass of firms to both elasticities: $\epsilon_{1-\tau_c}$ and $\epsilon_{1-\tau_d}$.

The model incorporates ex-ante heterogeneity in firm behavior: a share of firms behaves in line with the old view, while the remainder follows the new view. At a threshold level of taxable income, π^*, the corporate tax rate increases from $\tau_{c,0}$ to $\tau_{c,1}$, while the dividend tax rate simultaneously shifts from $\tau_{d,0}$ to $\tau_{d,1}$, creating a double kink. We assume that the effective tax rate on equity remains positive, resulting in a convex kink that induces a mass of firms to bunch at π^*. In what follows, we present the models main results; detailed assumptions and derivations are provided in the Appendix.

We begin by analyzing the marginal buncher firm under the new view. For this firm, the relative change in taxable income between the nonlinear and counterfactual linear tax schedules is given by:

$$\frac{\Delta\pi^*_{\text{n}}}{\pi^*} = \epsilon \log\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right)$$

Thus, for new view firms, this relative change is simply the product of the structural elasticity ϵ and the percentage change in corporate taxes, with dividend taxes playing no role in the analysis. Conversely, the marginal old-view firm adjusts its taxable profits as follows:

$$\frac{\Delta\pi^*_{\text{o}}}{\pi^*} = \epsilon \log\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right) + \epsilon \log\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}}\right)$$

Since, for old view firms, $\epsilon^{\text{o}}_{1-\tau_d} = \epsilon$, the relative change in taxable income is the product of the structural elasticity and the relative change in the effective rate on equity. Thus, unlike new view firms, old view firms adjust their income by accounting for the change in dividend taxes.

We next briefly describe the definitions and assumptions required to identify both aggregate elasticities, $\epsilon_{1-\tau_c}$ and $\epsilon_{1-\tau_d}$ through a bunching design.[5] Concretely, a bunching mass is defined as the share of firms that locate towards the kink under the nonlinear tax schedule. Formally, let $g_{\text{o}}(\pi)$ and $g_{\text{n}}(\pi)$ denote the counterfactual density function of taxable profits for old and new view firms. Then, the mass of bunching new view firms and old view firms will be given by

$$B_{\text{n}} = \int_{\pi^*}^{\pi^*+\Delta\pi^*_{\text{n}}} g_{\text{n}}(v)dv, \qquad B_{\text{o}} = \int_{\pi^*}^{\pi^*+\Delta\pi^*_{\text{o}}} g_{\text{o}}(v)dv \tag{8}$$

furthermore, let $g(v)$ denote the counterfactual distribution across all firms and B be the total bunching mass composed of both firm types.

[5] All assumptions and proofs for our propositions are provided in a formal manner in the Appendix.

As highlighted by Bertanha et al. (2023) and Blomquist et al. (2021), point identification of the ETI using the bunching estimator is not feasible without placing restrictions on the counterfactual income distribution. Thus, we rely on the assumption that both counterfactual distributions are uniform, as in Chetty et al. (2011). This assumption allows us link the bunching mass to the tax elasticities through our first proposition:

Proposition 1 (Bunching under double taxation)**.** *The relative average change in taxable income π is given by*

$$\frac{B}{\pi^* g(\pi^*)} = \frac{\overline{\Delta\pi^*}}{\pi^*} = \epsilon_{1-\tau_c} \log\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right) + \epsilon_{1-\tau_d} \log\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}}\right)$$

where B is the total share of bunching firms across all firms, $g(v)$ is the counterfactual taxable income density of all firms, $\overline{\Delta\pi^*}$ is the average marginal response, $\epsilon_{1-\tau_c} \equiv \epsilon$, $\epsilon_{1-\tau_d} \equiv \theta\epsilon$, and θ is the mass of old view firms in the overlapping bunching region which includes a mixture of both old and new view firms.

Proof. See the Appendix. ■

Proposition 1 extends the bunching framework of Saez (2010) and Chetty et al. (2011) to the setting of firms facing double taxation. Two key insights emerge from this result:

First, under this result, $\epsilon_{1-\tau_c}$ equals the structural elasticity, ϵ, while $\epsilon_{1-\tau_d} = \theta\epsilon + (1-\theta)\times 0$ represents a weighted average of elasticities at the kink threshold. Thus, in this setting, we obtain

$$\theta = \frac{\epsilon_{1-\tau_d}}{\epsilon_{1-\tau_c}}.$$

That is, under these assumptions, our corporate veil index is naturally reinterpreted as the share of old view firms at the overlapping bunching region, representing the local prevalence of old view firms over this window.

Second, this result sheds light on the necessary ingredients for identification. Concretely, when both the corporate and dividend tax schedules exhibit kinks, a single bunching moment is insufficient to identify both elasticities, as we are left with one equation and two unknowns. In this case, an additional bunching moment is required to estimate both parameters.[6]

To address this, we rely on a government tax reform that generates an additional bunching moment, yielding a second equation. Let B^0 and B^1 denote the observed bunching moments before and after the reform, respectively, and let $\tau^0_{k,l}$ and $\tau^1_{k,l}$ represent the corresponding tax rates, where $k \in \{c, d\}$ and $l \in \{0, 1\}$. Intuitively, two assumptions are required for identification: (i) a time-invariance assumption, ensuring that the structural elasticity does not change between reforms, and that the productivity distribution is stationary; and (ii) that the reform induces a linearly independent system of equations, thus ensuring a unique solution. Under these assumptions, we obtain our second proposition:

Proposition 2 (Full point-identification)**.** *The elasticities $\epsilon_{1-\tau_c}$ and $\epsilon_{1-\tau_d}$ are point identified and given by:*

$$\epsilon_{1-\tau_c} = \frac{1}{\pi^*}\left(\frac{b^0\ell^1_d - b^1\ell^0_d}{\ell^0_c\ell^1_d - \ell^0_d\ell^1_c}\right), \quad \epsilon_{1-\tau_d} = \frac{1}{\pi^*}\left(\frac{\ell^0_c b^1 - \ell^1_c b^0}{\ell^0_c\ell^1_d - \ell^0_d\ell^1_c}\right), \tag{9}$$

where $b^j = \frac{B^j}{g(\pi^*)}$ for $j \in \{0, 1\}$, represents the relative bunching moments and $\ell^j_k = \log\left(\frac{1-\tau^j_{k,0}}{1-\tau^j_{k,1}}\right)$ for $j \in \{0, 1\}$ and $k \in \{c, d\}$, are the log differences in tax rates.

Proof. See the Appendix. ■

This proposition provides a simple closed-form solution for the elasticities in terms of estimable relative bunching quantities and observed tax rates.

In our empirical application, we apply our proposed methodology to the Canadian corporate and dividend tax setting. In particular, the 2006 dividend tax reform that generates an additional kink can be used to estimate the elasticity of corporate taxable income with respect to both corporate and dividend net-of-tax rates. In the next section we discuss the Canadian institutional background and how it can be used to identify our elasticities.

[6] Additionally, our result indicates that, if there is no kink in the dividend tax schedule, then $\log\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}}\right) = 0$. In this case, all observed bunching reflects a response to the corporate tax kink, allowing us to estimate $\epsilon_{1-\tau_c}$ but not $\epsilon_{1-\tau_d}$ from a single bunching moment. This is the scenario in 2005 in our case study, enabling the estimation of $\epsilon_{1-\tau_c}$ using data from that year.

4 Institutional background

In this section, we describe how the taxation of firms in Canada operates. We first discuss how the corporate tax is levied on Canadian firms. We then describe the taxation of dividends at the shareholder level and the integration between corporate and dividend taxes through a dividend tax credit. Finally, we discuss the 2006 tax reform which increased this dividend tax credit, leading to lower double taxation.

4.1 Canadian corporate tax system

In Canada, firms pay corporate taxes depending on their structure, assets and location. Publicly traded and foreign-controlled firms pay the general business tax rate on all of their profits. In contrast, Canadian controlled private corporations (CCPCs) with less than $15 million[7] in taxable capital pay the substantially lower "small business tax rate" on profits up to the prescribed federal threshold — profits in excess of this threshold are taxed at the general rate.[8] This discounted tax rate is called the small business deduction (SBD)[9].

To illustrate how this corporate tax schedule operates, consider a CCPC that declares $200,000 in active income. This firm pays $37,240 in taxes as only the small business tax rate (the corporate tax rate after applying the small business deduction) is applied to its active income. In contrast, a CCPC entitled to the small business deduction that declares $400,000 in active income firm must pay $55,860 + $27,620 in corporate taxes (i.e., $300,000×18.62% and $100,000×27.62%). Importantly, this tax system produces a kink

[7]The $ symbol denotes Canadian dollars (CAD) unless stated otherwise.

[8]A firm is a Canadian Controlled Private Corporation if the following conditions met: i) it is a private corporation, ii) it is a corporation that resides in Canada and was either incorporated in Canada or resident in Canada from June 18, 1971, to the end of the tax year, iii) it is not controlled directly or indirectly by one or more non-resident persons, iv) it is not controlled directly or indirectly by one or more public corporations (other than a prescribed venture capital corporation, as defined in Regulation 6700 of the Income Tax Regulations), v) it is not controlled by a Canadian resident corporation that lists its shares on a designated stock exchange outside of Canada vi) it is not controlled directly or indirectly by any combination of persons described in the three previous conditions, vii) if all of its shares that are owned by a non-resident person, by a public corporation (other than a prescribed venture capital corporation), or by a corporation with a class of shares listed on a designated stock exchange were owned by one person, that person would not own sufficient shares to control the corporation, viii) no class of its shares of capital stock is listed on a designated stock exchange.

[9]The SBD is applicable for firms whose taxable capital is lower than $15 million, but it is reduced in a straight line base when the taxable capital higher than $10 million. In addition, for a legal definition of taxable capital, refer to Income Tax Act (R.S.C., 1985, c. 1 (5th Supp.))

due to the discontinuity in the marginal tax rate at the SBD threshold. This kink, in turn, generates incentives for tax planning since some firms may locate close to the left of the threshold to avoid the payment of the general tax rate. Theoretically, we should observe bunching close to the federal threshold.

4.2 Canadian dividend tax system

Since 1949 the Canadian tax system has been partially integrated, meaning that a dividend tax credit is given to shareholders when they receive their post corporate tax dividends from the firm. Under an integrated tax system, dividends are taxed at a lower tax rate to make the combined corporate and dividend tax rate close to the personal tax rate on other forms of income.

Since 1972, Canadian integration has been achieved through a "gross-up-and-credit" system that aims to reduce double taxation while fully taxing the underlying corporate income at each shareholder's own personal marginal tax rate. Integration thus works in two steps: (i) A gross-up rate (c) is applied to the after-corporate-tax dividend amount (div_t), (ii) A dividend tax credit is applied to the grossed-up amount. The final amount is the dividend tax credit (DTC), and the total dividend tax paid is the personal tax rate multiplied by the grossed up level of dividends minus the DTC. We summarize the relevant tax parameters for 2005 in columns (1) and (2) of Table 1.

As indicated by columns (1) and (2) in Table 1, there was a kink in the corporate tax schedule in 2005, with the marginal corporate tax rate increasing from 18.62% to 27.62% at 300,000 CAD. Notably, the dividend tax rate remained flat in 2005, which, as discussed in the previous section, suggests that all observed bunching can be attributed to firms' behavioral responses to the corporate tax schedule. This allows for the estimation of the elasticity of taxable income with respect to the corporate net-of-tax rate using only 2005 data. Additionally, Table 1 reveals that the effective tax rate on equity in 2005 was slightly higher than the top marginal tax rate on personal income, suggesting a small degree of underintegration for income below the SBD threshold. In contrast, column (2) shows that the effective tax rate on equity for the general business bracket exceeded the top marginal tax rate on personal income, implying only partial integration for income above the SBD threshold.

Table 1: Statutory marginal tax and credit rates before and after the 2006 reform

	Taxable income bracket			
	2005		2006	
	< 300000	≥ 300000	< 300000	≥ 300000
Tax parameters	(1)	(2)	(3)	(4)
Corporate tax schedule parameters				
Federal corporate tax rate (τ_c^F)	13.12%	22.12%	13.12%	22.12%
Provincial corporate tax rate (τ_c^P)	5.50%	5.50%	5.50%	5.50%
Corporate tax rate ($\tau_c = \tau_c^F + \tau_c^P$)	18.62%	27.62%	18.62%	27.62%
Personal tax schedule parameters				
Federal personal tax rate (τ_p^F)	29.00%	29.00%	29.00%	29.00%
Provincial personal tax rate (τ_p^P)	13.92%	13.92%	13.92%	13.92%
Personal tax rate ($\tau_p = \tau_p^F + \tau_p^P$)	42.92%	42.92%	42.92%	42.92%
Dividend credit schedule parameters				
Federal dividend tax credit (λ^F)	13.33%	13.33%	13.33%	18.97%
Provincial dividend tax credit (λ^P)	5.13%	5.13%	5.13%	6.50%
Dividend tax credit ($\lambda = \lambda^F + \lambda^P$)	18.46%	18.46%	18.46%	25.47%
Gross-up rate (g)	25.00%	25.00%	25.00%	45.00%
Effective dividend tax rate ($\tau_d = [\tau_p - \lambda][1 + g]$)	30.57%	30.57%	30.57%	25.31%
Effective tax rate on equity ($\tau_e = \tau_c + [1 - \tau_c]\tau_d$)	43.50%	49.75%	43.50%	45.94%

Note: This table presents the statutory marginal tax and credit rates applicable to CCPCs and their shareholders before and after the 2006 reform. Columns (1) and (2) correspond to the 2005 tax regime for income below and above 300,000 CAD, respectively, while columns (3) and (4) report the same brackets after the 2006 system. All rates are sourced from the Canadian Tax and Credit Simulator and *Finances of the Nation*. Provinces such as British Columbia, Alberta, Manitoba, and Ontario applied a provincial corporate tax kink at 400,000 CAD in 2005-2006, while Quebec implemented a kink at 400,000 CAD in 2006. Because our kink of interest lies at 300,000 CAD, below the provincial threshold, the applicable federal corporate tax rate remains constant across brackets. We adopt Ontario's 5.5% provincial rate as it is not only representative of the largest provinces that feature the 400,000 CAD kink, but also because Ontario itself is the largest province by economic activity and firm count. For personal taxes, we assume that shareholders face the top marginal personal income tax rate, yielding a combined federalprovincial rate of 42.92% according to *Finances of the Nation* 2005, and an implied personal tax rate of 13.92% after accounting for dividend gross-up and credits. For the provincial dividend tax credit, we again adopt Ontarios rate, which is broadly consistent with other large provinces. Lastly, we note that there was no province-specific gross-up rate during this period.

4.3 The 2006 tax reform

In November 2005, a major dividend tax reform was announced and subsequently implemented in 2006. The primary objective was to increase the integration rate for firms paying the general corporate tax rate. To achieve this, the reform introduced the concept of "eligible" dividends to distinguish between dividends entitled to higher dividend tax credits (DTCs) and those that receive lower DTCs due to being paid from income taxed at the small business tax rate.

An "eligible" dividend is paid from income exceeding the federal threshold and qualifies for a higher DTC, whereas a "non-eligible" dividend, paid from income below the threshold, receives a DTC aligned with the small business tax rate.[10]

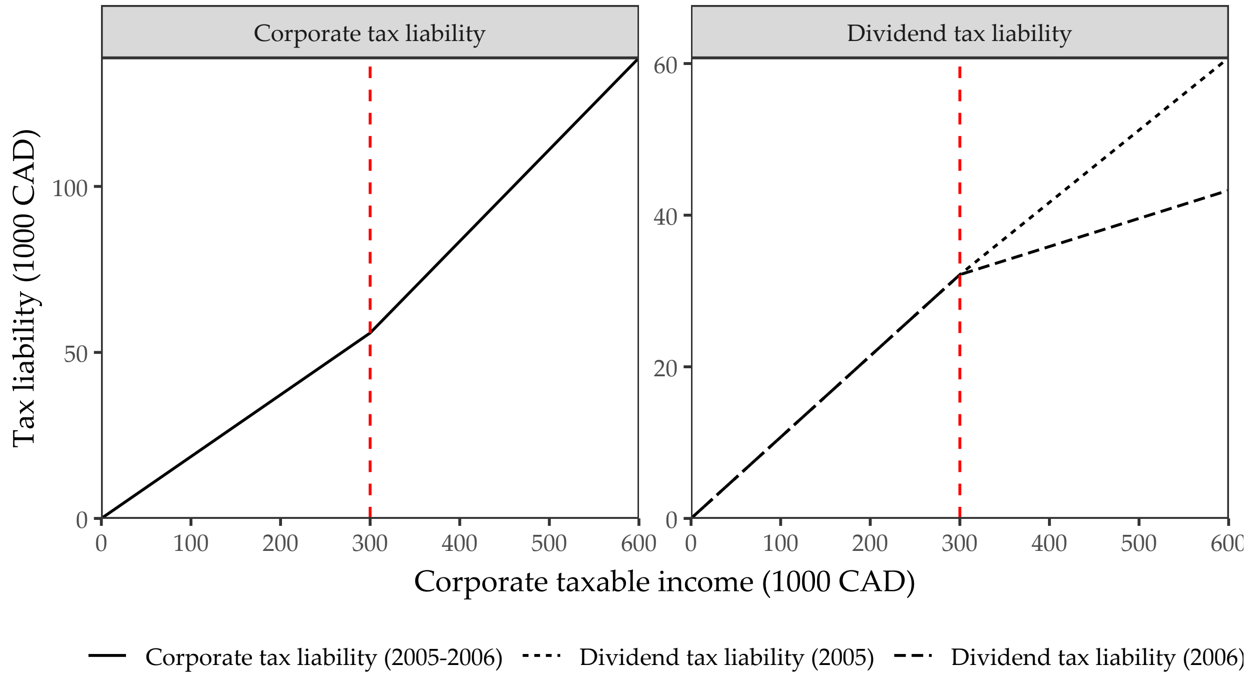
As shown in column (4) of Table 1, the reform increased both federal and provincial DTCs, as well as the gross-up rate for shareholders of large corporations (non-CCPCs). The combined effect of the higher DTCs and gross-up rate resulted in a reduction of the marginal dividend tax rate for income exceeding the Small Business Deduction (SBD) threshold. Specifically, the effective marginal dividend tax rate dropped from 30.57% to 25.31% for taxable profits above 300,000 CAD, creating a non-convex kink in the dividend tax schedule.

4.4 The Canadian tax system and our identification strategy in a nutshell

We present Figure 1, which summarizes how the tax system integrated corporate and dividend taxes for CCPCs in 2005 and 2006. The left panel depicts the corporate tax schedule, while, the right panel depicts how the dividend tax reform affected effective dividend taxation. The left panel from Figure 1 shows the piecewise linear corporate tax schedule for the year 2005, when the SBD threshold was set at $300,000, the federal and provincial combined "small business tax rate" was 0.1862, and the federal and provincial combined general rate was 0.2762. This tax structure remains constant during 2006

[10] To differentiate between "eligible" and "non-eligible" dividends, a new tax form, Schedule 55, was created. This form contains the General Rate Income Pool (GRIP), which tracks the amount of eligible dividends that a CCPC can issue in a given year. Small firms may only pay eligible dividends up to the amount recorded in their GRIP. If a CCPC issues eligible dividends beyond this limit, an additional tax is imposed on the excess. Notably, the introduction of eligible dividends and the GRIP was unannounced, and eligible dividends could be retroactively tracked back to 2001 using the GRIP account.

Figure 1: Corporate and dividend tax rate scheme for CCPCs in 2005 and 2006.



Note: This figure presents the corporate and dividend tax schedules for CCPCs in the left and right panels, respectively. To illustrate the dividend tax scheme, we assume that firms distribute all net-of-tax profits as dividends. The left panel shows a convex kink in the corporate tax schedule, which remains unchanged in 2005-2006. The right panel displays the linear dividend tax schedule in 2005, indicated by the dashed line. The short-dashed line represents the new schedule after the 2006 reform, which exhibits a non-convex kink: dividends paid from corporate taxable income in excess of 300,000 CAD face a lower effective personal marginal tax rate.

meaning that there is no change in the corporate tax system or the $300,000 threshold. Moreover, as we can see in the right panel from Figure 1, the 2006 tax reform creates a non-convex kink in the dividend tax liability. This means that in 2006 there are two kinks in the same threshold. The convex corporate tax kink and the non-convex dividend tax kink. As demonstrated by our model, this non-convex kink reduces the incentive for firms to bunch at the kink point. Notice that this institutional setting allow us to apply our identification strategy developed in Section 3. Specifically, the fact that the corporate tax schedule remained unchanged between 2005 and 2006, allows us to estimate the elasticity of taxable income with respect to the dividend net-of-tax rate by comparing the reduction in bunching across these years.

5 Data and estimation

5.1 Data

We use administrative data from the T2 Corporation Income Tax Return Form, which contains tax information for all businesses in Canada. The information is contained at the business number level (line 001 on the T2 tax reform). Additionally, we have access to the firm's province (line 016) and taxable income (line 360).[11] Information on firms' labour inputs is provided by the Longitudinal Employment Analysis Program (LEAP) database, which includes annual employment information for each employer in Canada, starting with the 1983 reference year. The information in LEAP is generated from the annual statements of remuneration paid (T4 slips) that Canadian businesses are required to issue to their employees for tax purposes. The LEAP covers incorporated and unincorporated businesses that issue at least one T4 slip in any given calendar year but excludes self-employed individuals or partnerships where the participants do not draw salaries.

With these data, we can compare firms' density pre- and post-reform based on active income reported in their 2005s tax return, filled before the reform, and in their 2006s tax return, filled after the adoption of the reform. These densities are reported in Figure **??**:

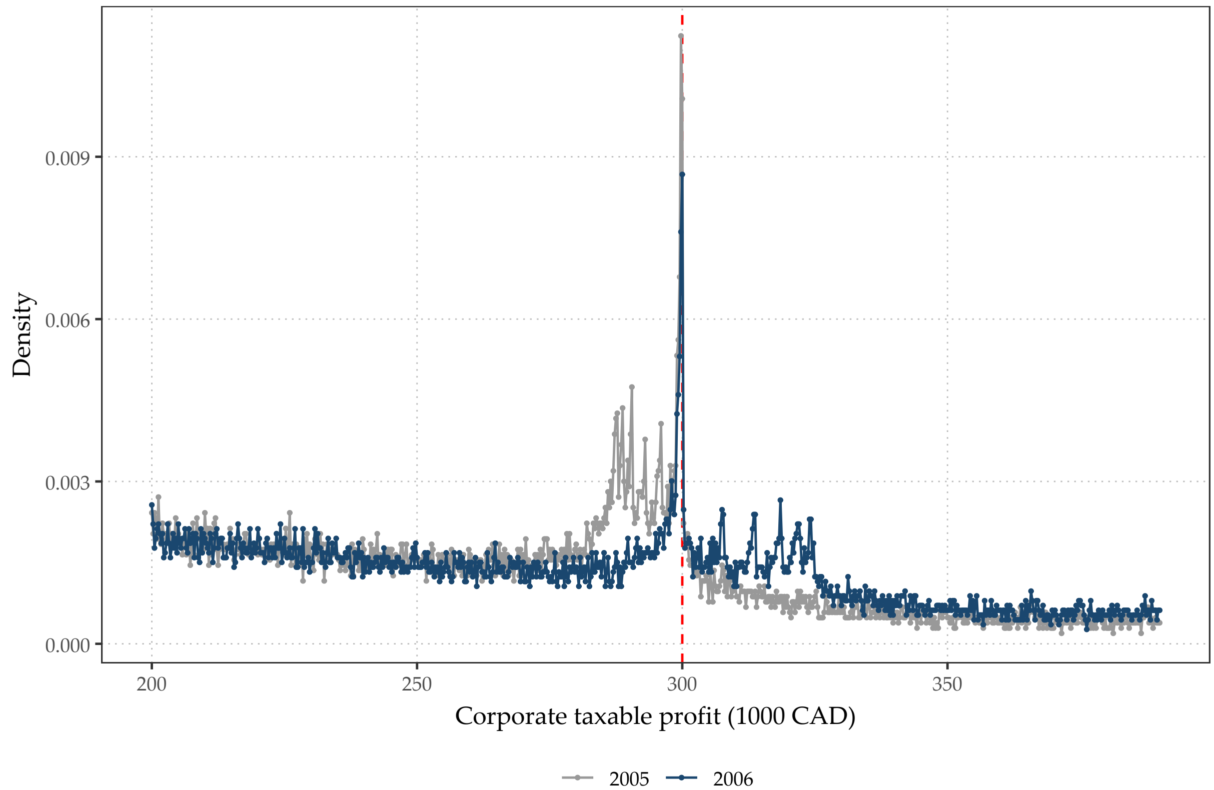
The distribution before the tax reform (gray curve) suggests bunching at the SBD threshold. However, following the 2006 reform, which increased integration for large corporations, a decrease in bunching is observed (blue curve), indicating an immediate behavioral response to the reduction in dividend taxes. This aligns with our model's prediction that firms would exhibit bunching in 2005 due to the kink in the corporate tax schedule. Notably, as predicted, the introduction of a non-convex kink in the dividend tax schedule leads to reduced bunching. The observed behaviour raise questions about the potential welfare effects of reducing the dividend tax rate.

5.2 Empirical estimation

Our strategy relies on the fact that in 2005, prior to the reform, we only observe a kink in the tax schedule due to changes in the marginal corporate tax rate. Specifically, as shown in Table 1, the marginal corporate tax rate jumps from 18.62% to 27.62% at the

[11] Taxable income serves as a proxy for income from active businesses carried on in Canada (line 400).

Figure 2: Lower effective dividend taxes causes an immediate response by firms



Note: This figure shows the distribution of CCPCs' taxable income around the 300,000 CAD threshold, depicted by a red vertical line, that determines access to the Small Business Deduction (SBD). Bin size is 250 CAD, with the grey curve depicting the distribution of taxable income reported in 2005, before the reform, and the blue curve showing the same distribution in 2006, after the reform was enacted. The sharp excess mass in 2005 reflects clear bunching behavior at the kink in the corporate tax schedule. Following the 2006 reform, which reduced the effective dividend tax rate for firms above the threshold, the excess mass sharply declines. The data are drawn from the T2 Corporation Income Tax Return (line 360).

SBD threshold, while the effective dividend tax rate (and all other tax parameters) remain stable across brackets. This allows us to estimate the elasticity of taxable income with respect to the corporate tax rate using the 2005 bunching mass. In contrast, in 2006, both the corporate tax rate and the effective dividend tax rate change across the SBD threshold, suggesting lower incentives for bunching. Thus, under a stationarity assumption, we can interpret the reduction in bunching as a behavioral response to the effective dividend tax credit rate, allowing us to estimate the elasticity of taxable income with respect to the dividend tax credit rate using the 2006 bunching mass.

Importantly, estimating the excess bunching around the SBD threshold requires the imputation of counterfactual distributions. In this regard, the literature has largely relied on the assumption of a polynomial functional form, as in Chetty et al. (2011) and Devereux et al.

(2014). Nonetheless, Blomquist et al. (2021) criticize the idea of imposing a functional form for the counterfactual density. They argue that the bunching estimator cannot identify the taxable earnings elasticity if the counterfactual distribution is left unrestricted.[12] To understand this, recall equation the definition of bunching:

$$B = \int_{\pi^*}^{\pi^*+\Delta\pi^*} g(v)dv. \tag{10}$$

Concretely, we only observe the number of firms located at the bunching area B, so it is impossible to identify the magnitude of the change in $\Delta\pi^*$. In turn, this is the parameter used to estimate both the elasticity of taxable income and $g(v)$, which is the counterfactual distribution that induces a technology distribution for firms.[13] Blomquist et al. (2021) argue that assuming a polynomial or a uniform distribution for the counterfactual is stronger than a parametric assumption because it involves imposing an exact form for the firms' technology distribution.

To address this identification issue, we follow Devereux et al. (2014), Gelber et al. (2020), and Londoño-Vélez and Ávila Mahecha (2024) by estimating a nonparametric counterfactual distribution. This estimation approach aligns with our identification strategy, as it assumes that the shape of the underlying probability density function remains stationary and is unaffected by the tax reform.[14] Concretely, we first approximate the distribution with a histogram, dividing the distribution into bins of size κ. Let c_j denote the number of firms in bin j and z_j the mean earnings level relative to the federal threshold (or kink point). The objective is to estimate counterfactual values of c_j. We denote these estimates by $\hat{c}_j$ in the case of bins near the threshold where bunching due to tax planning would be expected to occur. Then, we compute $\hat{c}_j$ using the distribution of 2010, a post-reform year where the bunching threshold is found at $\$500,000$.[15] Then, we can directly estimate the counterfactual distribution using the histogram estimator:

$$\hat{p}_H = \frac{c_{j,t_{post}}}{\sum_{i=z_{min}}^{z_{max}} c_{j,t_{post}}}. \tag{11}$$

[12] Bertanha et al. (2023) address the issue raised by Blomquist et al. (2021) by assimilating bunching to a censoring problem. Blomquist et al. (2021) show that by restricting the slope of the counterfactual distribution, it is possible to non-parametrically identify bounds on the ETI.

[13] Saez (2010) and Chetty et al. (2011) refer to the distribution of preferences over leisure. In the case of firms, there is a technology distribution for tax planning of the owners.

[14] More formally we require that $g(z) = g(z|t)$ where t is time.

[15] We provide supporting evidence for this assumption and estimate the elasticities using alternative years in Section 6.2, showing that our results remain robust.

Then, the counterfactual estimator is:

$$\hat{c}_j = \hat{p}_H \cdot \sum_{i=z_{min}}^{z_{max}} c_{j,t_{pre}}. \tag{12}$$

Then, our estimate of excess bunching, defined as the difference between the observed and counterfactual bin counts within the excluded range, is given by

$$\hat{B} = \sum_{j=z_l}^{z_u} (c_j - \hat{c}_j)$$

where $[z_l, z_u]$ denotes the bunching window, which is first selected through visual inspection. Next, we can derive the relative excess bunching as:

$$\hat{b} = \frac{\hat{B}}{\left(\sum_{j=z_l}^{z_u} \frac{\hat{c}_j}{N}\right)}, \tag{13}$$

where N the number of bins in the excluded range. Then, we apply Proposition 2 to our empirical setting and replace the bunching moments with their empirical counterparts, which yield the following expressions for the ECTI with respect to the corporate net-of-tax and the dividend net-of-tax as:

$$\hat{\epsilon}_{1-\tau^d} = \frac{\hat{b}_{2005} - \hat{b}_{2006}}{\pi^* \cdot \ln\left(\frac{1-\tau_2^{d,2006}}{1-\tau_2^{d,2005}}\right)}, \tag{14}$$

$$\hat{\epsilon}_{1-\tau^c} = \frac{\hat{b}_{2005}}{\pi^* \cdot \ln\left(\frac{1-\tau_1^{c,2005}}{1-\tau_2^{c,2005}}\right)}, \tag{15}$$

where $\hat{b}_{2005}$ and $\hat{b}_{2006}$ represent the relative excess bunching for 2005 and 2006, respectively. Standard errors are computed using a bootstrap resampling approach in line with Londoño-Vélez and Ávila Mahecha (2024). Finally, we also estimate the counterfactual distribution using the traditional polynomial strategy first introduced by Chetty et al. (2011), finding similar results for low-degree polynomials.

6 Empirical results

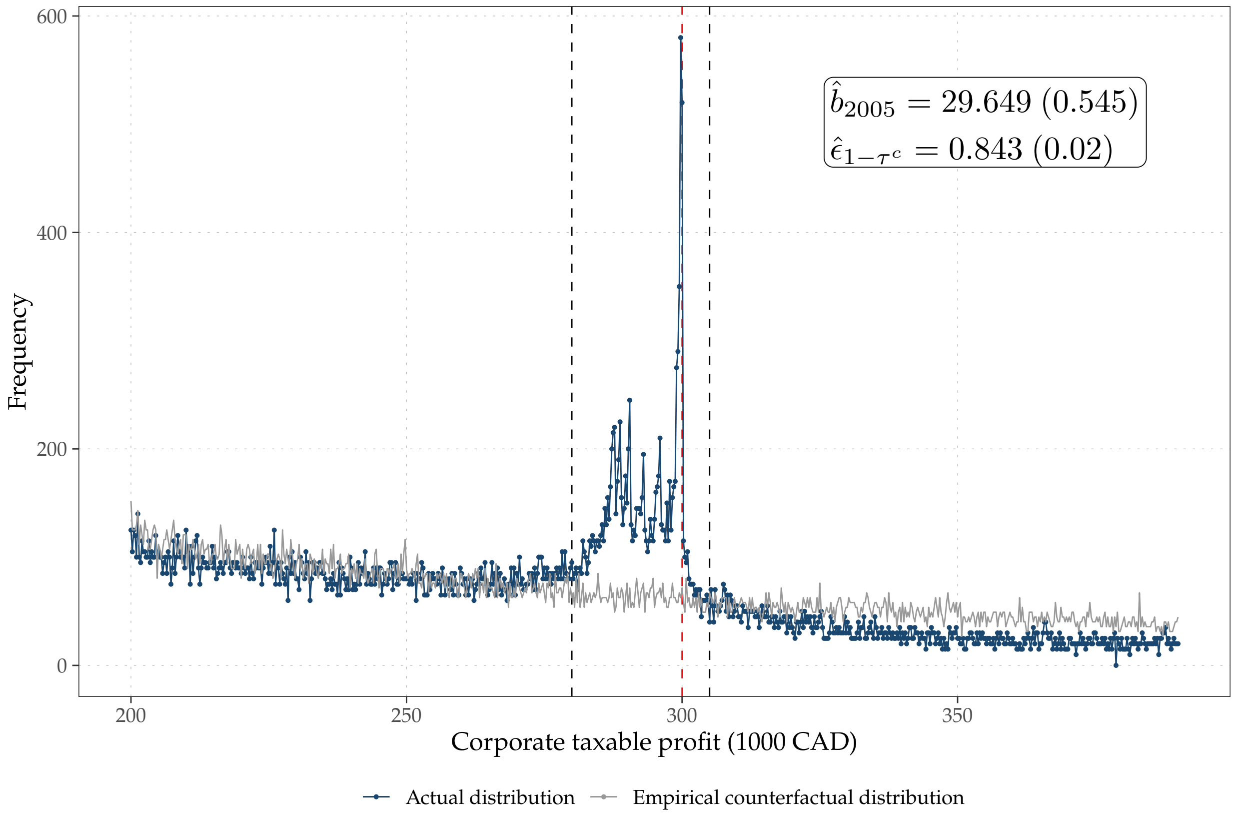
6.1 Baseline results

We apply the methodology described in the previous section to estimate the excess bunching for Canada during 2005 and 2006. First, we define bins of \$250. Second, by inspection, we set $z_l = \$280,000$ and $z_u = \$305,000$ for 2005 and $z_l = 280,000$ and $z_u = \$330,000$ for 2006. We then estimate the counterfactual distribution by following the procedure described above. Figure 3 shows the observed and counterfactual densities around \$300,000 for 2005. The dashed vertical black lines demarcate excluded income ranges, while the dashed vertical red line represents the kink found at \$300,000. The blue points plot the observed number of firms in each bin, while the grey curve shows the counterfactual distribution based on the 2010 distribution using firms with taxable income between \$200,000 and \$390,000.

There are several notable observations from the figure. First, there is a large and sharp bunched mass around \$300,000. The relative excess mass b_{2005} is estimated to be 29.65 times the density predicted by the counterfactual distribution, providing strong evidence that firms respond to the tax structure. Second, bunching at \$300,000 is asymmetric, as the income range clearly affected by the bunching around the kink lies between \$280,000 and \$305,000. Moreover, there is considerably more excess mass to the left of the kink than to its right. The greater mass to the left of the kink appears to reflect some degree of risk aversion, as firms may seek to avoid reporting revenues too close to the threshold by not decreasing revenues or increasing costs excessively.

The estimated relative excess mass suggests an elasticity of taxable income with respect to the corporate net-of-tax rate of 0.843 (s.e 0.02). This indicates that a 1% increase in the corporate net-of-tax rate results in a 0.843% increase in reported taxable income. These estimates are statistically significant at the conventional 95% confidence level and align with recent findings on the elasticity of taxable income with respect to the corporate tax rate. Specifically, Boonzaaier et al. (2019) estimates an elasticity of 0.7 at a lower kink for small firms in South Africa, while Lediga et al. (2019) reports similar results for South African firms. Notably, these elasticities are three to four times higher than those estimated by Devereux et al. (2014) for the UK, which may be explained by differences in tax environments across countries.

Figure 3: Distribution of taxable income for 2005.

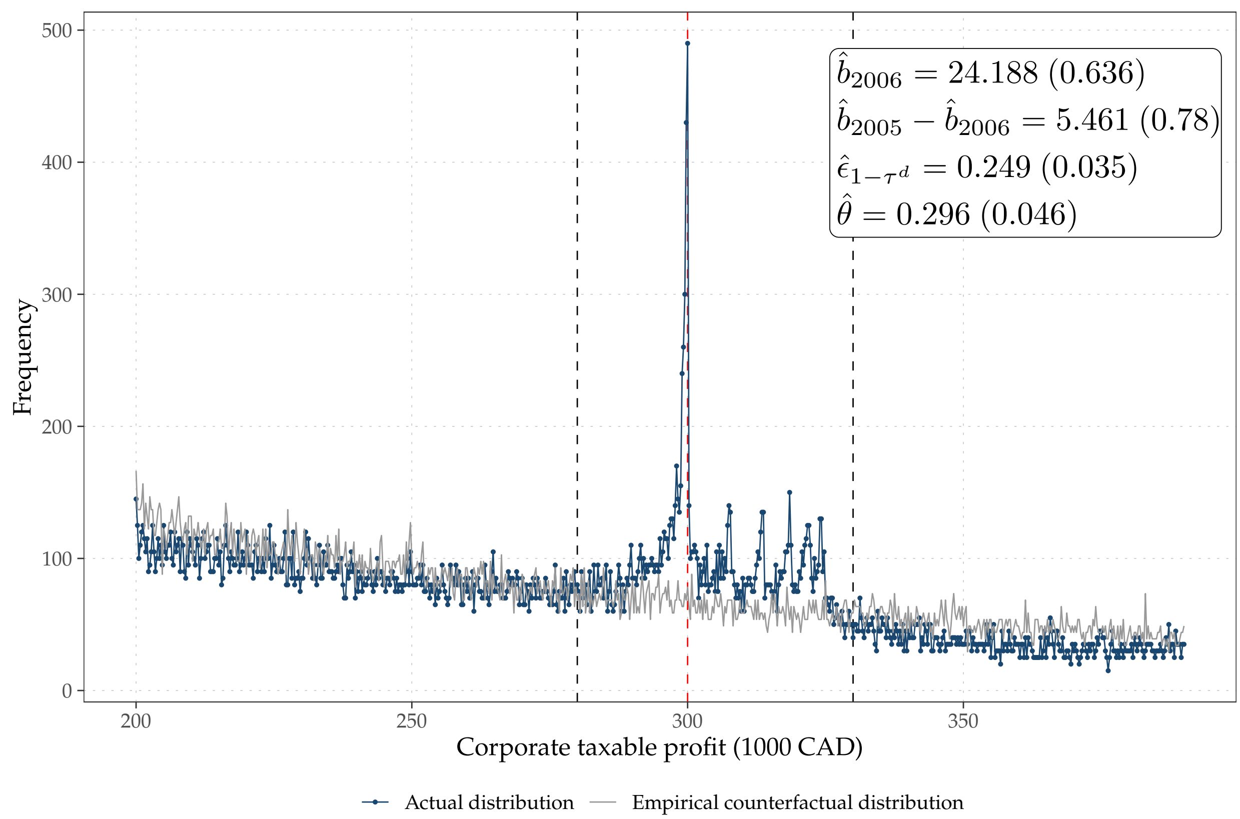


Note: This figure depicts the distribution of corporate taxable income in 2005, before the reform. Bin size is $250. The dashed grey line are the bunching areas and the solid red line is the empirical counterfactual distribution estimated using the methodology from Devereux et al. (2014) and Londoño-Vélez and Ávila Mahecha (2024). $\hat{b}_{2005}$ represents the estimated relative excess masses in 2005. $\hat{\epsilon}_{1-\tau^c}$ denotes the estimated elasticity of corporate taxable income with respect to the corporate net-of-tax rate. Bootstrapped standard errors are reported in parentheses.

Next, we examine how bunching was affected by the 2006 reform. Figure 4 presents the observed and counterfactual densities around $300,000 for 2006. The excluded income range is again demarcated by the dashed vertical black lines, while the counterfactual density is estimated using the distribution of taxable income between $200,000 and $400,000 in 2010.

A few comparisons relative to the figure for 2005 are worth noting. First there is sharp bunching around $300,000, though less than in 2005. Moreover, although the bunching is still asymmetric, where the bunching windows is between $280,000 and 330,000 now it is more pronounced to the right of the threshold point, which is evidence that there is a shift to the right of the distribution. Also, the relative excess mass b_{2006} is 24.19 times the density predicted by the counterfactual distribution which is close to a 80% of the relative mass excess found in 2005. This provides evidence that in 2006, firms responded less strongly to the tax structure than in 2005.

Figure 4: Distribution of taxable income for 2006.



Note: This figure depicts the distribution of corporate taxable income in 2006, after the reform. Bin size is \$250. The dashed grey line are the bunching areas and the solid red line is the empirical counterfactual distribution estimated using the methodology from Devereux et al. (2014) and Londoño-Vélez and Ávila Mahecha (2024). $\hat{b}_{2005}$ and $\hat{b}_{2006}$ represent the estimated relative excess masses in 2005 and 2006, respectively. $\hat{\epsilon}_{1-\tau^d}$ denotes the estimated elasticity of corporate taxable income with respect to the dividend net-of-tax rate. $\hat{\theta}$ is the estimated corporate veil index, defined as the ratio of $\hat{\epsilon}_{1-\tau^d}$ to $\hat{\epsilon}_{1-\tau^c}$. Bootstrapped standard errors are reported in parentheses.

The difference in relative bunching between 2005 and 2006 is estimated at 5.461. This decrease in bunching implies that the elasticity of taxable income with respect to $1 - \tau_d$ is estimated at 0.249 (s.e 0.035). This elasticity, which is statistically significant at the 95% level, suggests that a 1% increase in one minus the dividend tax produces a 0.241% increase in reported taxable income.

Together, these elasticities imply an estimated corporate veil index of $\hat{\theta} = 0.296$ (s.e 0.046).

This result supports neither the old nor the new view of dividend taxation. Rather, it suggests that firms are approximately 3.4 times more responsive to changes in the corporate tax rate than to changes in the dividend tax rate. Although firms do respond to dividend taxation, in line with the old view, their response is considerably more modest than their reaction to corporate taxes, which aligns more closely, but not fully, with the new view.

6.2 Robustness checks

We now assess the plausibility of our identifying assumptions and examine the sensitivity of our estimates to alternative empirical strategies. Specifically, we conduct a series of robustness exercises. First, we test the stationarity of the counterfactual distribution by re-estimating elasticities using different years to construct the empirical counterfactual. Second, we evaluate the robustness of our results to alternative choices of the bunching window. Third, we implement the filtering procedure proposed by Bertanha et al. (2023) to recover a distribution free from optimization frictions. Finally, we revisit the traditional polynomial fitting approach to estimate the counterfactual distribution, despite its known drawbacks, to facilitate comparison with existing studies.

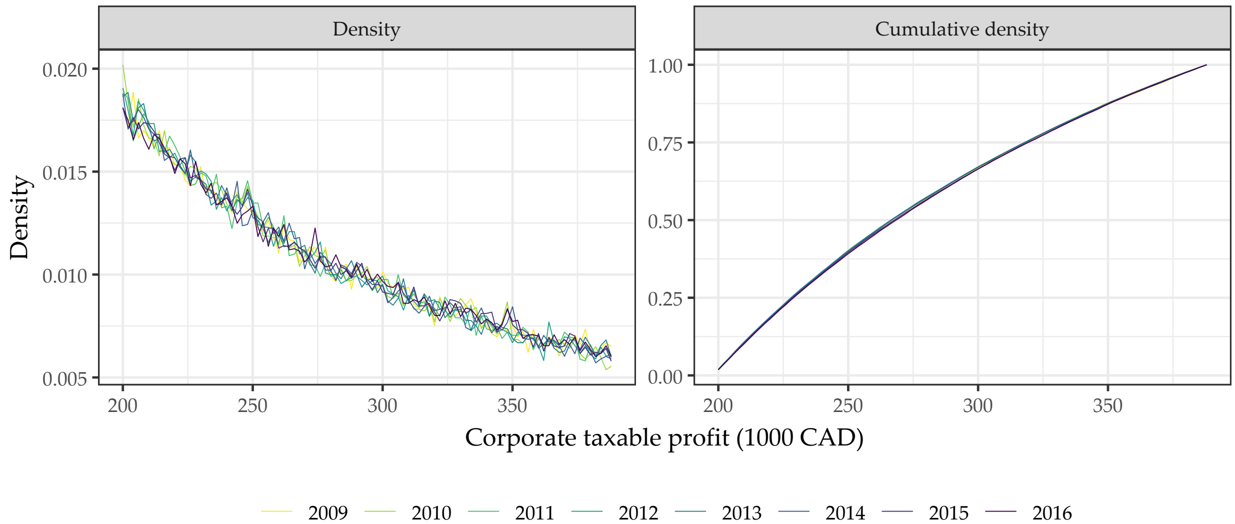
6.2.1 Stationarity and alternative empirical counterfactuals for the corporate taxable income

As discussed previously, our identification and estimation strategy hinge on a stationarity assumption for the counterfactual income distribution $g(v)$.[16] Figure 5 provides evidence for the plausibility of this assumption by plotting the distribution of taxable income for the years 2009-2016.

The left panel from Figure 5 plots the distribution of taxable income for each year in the 2010-2016 period for the [$200,000; $390,000] interval, while the right panel plots the cumulative distribution of taxable income. Importantly, for these years this interval was kinkless, which allows us to test our key identification assumption. These figures suggest that the distribution of corporate taxable income remains fairly stable across years. In particular, Figure 5 shows that the absolute distances between the cumulative distributions are extremely small, implying that we cannot reject the hypothesis that the

[16] For more technical details regarding the identifying assumptions refer to the Appendix.

Figure 5: Distribution of taxable income for 2010-2016



Note: This figure assesses the stationarity of the counterfactual distribution of taxable income by plotting the distribution and cumulative distribution of corporate taxable income for CCPCs from 2009 to 2016, shown in the left and right panels, respectively. A bin size of $2,000 is used to reduce noise in the construction of the empirical distribution. We omit the years 2007 and 2008 due to the presence of a kink at 400,000 CAD.

observed counts stem from the same underlying distribution.

We further test the sensitivity of our elasticities to alternative years in the construction of the counterfactual distribution. Table 2 reports the relevant estimates.

Table 2 suggests that our elasticity estimates are not sensitive to the choice of year used to construct the counterfactual no-kink distribution. In particular, the elasticity of taxable income with respect to the corporate net-of-tax rate ranges from 0.798 to 0.857, while the elasticity with respect to the dividend net-of-tax rate ranges from 0.249 to 0.298. Consequently, $\hat{\theta}$ varies from 0.296, our baseline estimate, to 0.355. All of these estimates are statistically significant at the conventional 95% confidence level.

6.2.2 Sensitivity of bunching windows

We examine the sensitivity of our estimate to changes in the bunching windows. Table 3 reports the relevant estimates for the elasticity of taxable income with respect to the corporate net-of-tax rate.

Two key insights can be drawn from Table 3. First, variations in the upper bound of the bunching window do not appear to affect the estimated elasticity. This lack of impact is

Table 2: Estimates of the elasticities, the corporate veil index, and relative excess bunching for 2005 and 2006 under alternative counterfactual distributions..

Year	$\hat{b}_{2005}$	$\hat{b}_{2006}$	$\hat{b}_{2005} - \hat{b}_{2006}$	$\hat{\epsilon}_{1-\tau_c}$	$\hat{\epsilon}_{1-\tau_d}$	$\hat{\theta}$
2009	29.222	23.149	6.073	0.831	0.277	0.334
	(0.636)	(0.781)	(1.049)	(0.018)	(0.048)	(0.057)
2010	29.649	24.188	5.461	0.843	0.249	0.296
	(0.664)	(0.672)	(1.005)	(0.019)	(0.046)	(0.058)
2011	29.414	23.107	6.308	0.837	0.288	0.344
	(0.595)	(0.577)	(0.95)	(0.017)	(0.043)	(0.061)
2012	30.145	23.906	6.239	0.857	0.285	0.332
	(0.471)	(0.625)	(0.783)	(0.013)	(0.036)	(0.053)
2013	29.968	23.448	6.52	0.852	0.298	0.349
	(0.487)	(0.418)	(0.621)	(0.014)	(0.028)	(0.044)
2014	29.338	23.217	6.121	0.834	0.279	0.335
	(0.435)	(0.488)	(0.667)	(0.012)	(0.03)	(0.053)
2015	29.411	22.909	6.503	0.837	0.297	0.355
	(0.395)	(0.52)	(0.591)	(0.011)	(0.027)	(0.049)
2016	28.057	22.221	5.836	0.798	0.266	0.334
	(0.358)	(0.43)	(0.57)	(0.01)	(0.026)	(0.051)

Note: This table shows the sensitivity of our estimates to the choice of year used to construct the counterfactual. $\hat{b}_{2005}$ and $\hat{b}_{2006}$ represent the estimated relative excess masses in 2005 and 2006, respectively. $\hat{\epsilon}_{1-\tau^c}$ and $\hat{\epsilon}_{1-\tau^d}$ denote the estimated elasticities of corporate taxable income with respect to the corporate and dividend net-of-tax rates, respectively. $\hat{\theta}$ is the estimated corporate veil index, defined as the ratio of $\hat{\epsilon}_{1-\tau^d}$ to $\hat{\epsilon}_{1-\tau^c}$. Bootstrapped standard errors are reported in parentheses. We omit the years 2007 and 2008 due to the presence of a kink at 400,000 CAD.

likely due to the absence of diffuse bunching on the right side of the kink, meaning that changes in the upper bound do not influence the estimation of relative density. Second, because most of the diffuse bunching occurs near the left side of the kink, increasing the lower bound of the bunching window results in a lower estimated elasticity. In contrast, reducing this lower bound leads to consistent elasticity estimates. Next, we examine the robustness of our estimates to changes in the 2006 bunching windows. The results are shown in Table 4.

Table 3: Sensitivity of $\hat{\epsilon}_{1-\tau^c}$ to the choice of bunching window bounds in 2005

Lower bound	Upper bound				
	300	305	310	315	320
270	0.821	0.87	0.884	0.885	0.866
	(0.016)	(0.017)	(0.02)	(0.019)	(0.021)
275	0.812	0.861	0.875	0.877	0.856
	(0.019)	(0.017)	(0.017)	(0.019)	(0.021)
280	0.793	0.843	0.857	0.858	0.836
	(0.02)	(0.016)	(0.019)	(0.022)	(0.017)
285	0.724	0.776	0.789	0.79	0.767
	(0.018)	(0.021)	(0.021)	(0.021)	(0.018)
290	0.505	0.558	0.57	0.568	0.542
	(0.015)	(0.015)	(0.015)	(0.017)	(0.018)

Note: This table reports the sensitivity of our estimates of the elasticity of corporate taxable income with respect to the dividend net-of-tax rate to alternative choices of the lower and upper bounds of the bunching window in 2006. Since the estimation of $\hat{\epsilon}_{1-\tau^d}$ relies on bunching behavior in both 2005 and 2006, we hold the 2005 bunching window fixed at the baseline bounds and vary only the 2006 bounds. Each row corresponds to a different lower bound, and each column to a different upper bound. The matrix entries report the estimated elasticity, with bootstrapped standard errors in parentheses.

Table 4 demonstrates that our estimation of $\hat{\epsilon}_{1-\tau_d}$ remains robust to variations in the choice of bunching windows for the 2006 period. Notably, reducing the upper bound of the bunching window relative to our baseline estimation results in an increase in the estimated elasticity. This occurs because the majority of diffuse bunching in 2006 is observed to the right of the kink. Consequently, increasing the upper bound of the bunching window leads to an overstated reduction in observed bunching following the 2006 reform. Additionally, Table 4 indicates that altering the lower bound leads to a slight increase in the estimated elasticity.

Overall, these estimates show that the sign, magnitude, and statistical significance of our baseline elasticities remain robust to variations in the choice of bunching windows.

Table 4: Sensitivity of $\hat{\epsilon}_{1-\tau^d}$ to the choice of bunching window bounds in 2006

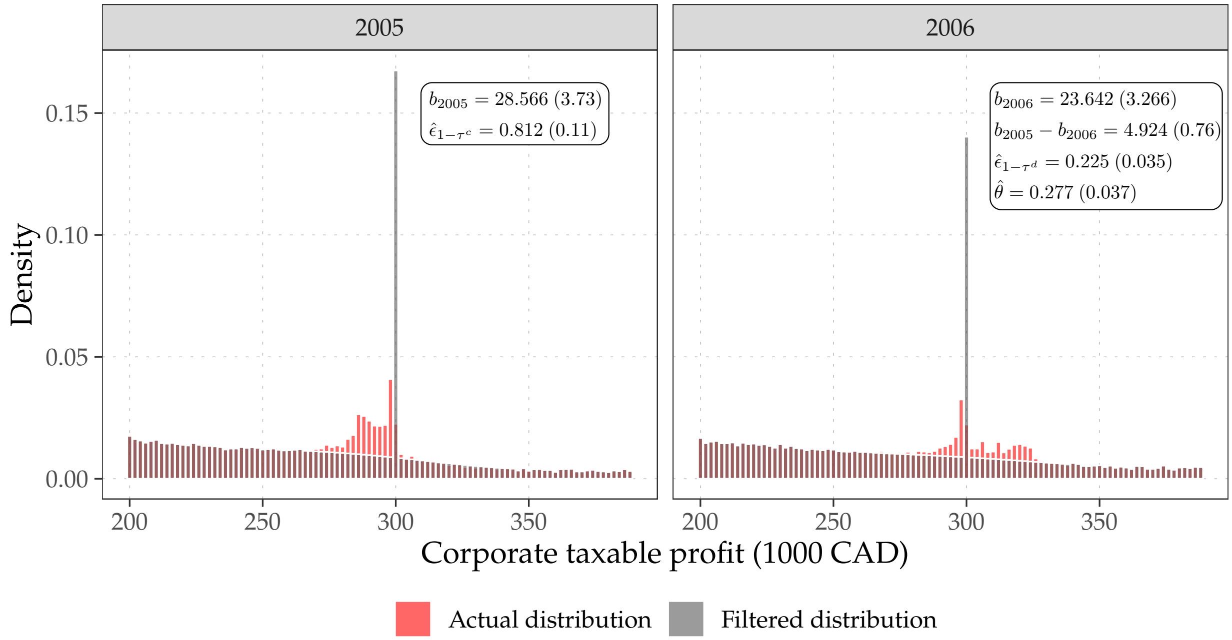
Lower bound	Upper bound				
	320	325	330	335	340
270	0.458	0.313	0.3	0.333	0.369
	(0.037)	(0.036)	(0.042)	(0.033)	(0.038)
275	0.431	0.283	0.271	0.304	0.341
	(0.036)	(0.036)	(0.04)	(0.038)	(0.039)
280	0.404	0.254	0.241	0.276	0.314
	(0.038)	(0.038)	(0.039)	(0.039)	(0.043)
285	0.412	0.261	0.248	0.284	0.322
	(0.039)	(0.04)	(0.038)	(0.038)	(0.04)
290	0.44	0.287	0.273	0.311	0.35
	(0.04)	(0.038)	(0.04)	(0.045)	(0.043)

Note: This table reports the sensitivity of our estimates of the elasticity of corporate taxable income with respect to the dividend net-of-tax rate to alternative choices of the lower and upper bounds of the bunching window in 2006, while keeping 2005 bounds fixed at its baseline. Each row corresponds to a different lower bound, and each column to a different upper bound. The matrix entries display the estimated elasticity, with bootstrapped standard errors in parentheses.

6.2.3 Filtering of optimization frictions

The original bunching estimator proposed by Saez (2010), along with much of the subsequent literature, was developed under the assumption of frictionless data, a setting that also underlies our main analysis. In practice, however, reported income often includes friction errors. That is, researchers observe $\tilde{\pi} = \pi + e$, where e is a random variable capturing optimization frictions. In our case study, this is reflected by the presence of diffuse bunching: prior to the 2006 reform, we observe excess mass to the left of the kink, which shifts to the right after the reform. This can be explained by the reduced cost of not bunching due to the increase in the corporate tax rate that can be used as a dividend tax credit. This excess credit is not lost even if the corporate taxable income taxed under the general rate are not paid as dividend in 2006.Indeed, as we discussed previously, all taxable income that pay the general corporate tax rate after 2001 can be accumulated under the general rate income pool (GRIP).

Figure 6: Filtered distribution of taxable income in 2005 and 2006



Note: This figure displays the reported and filtered distributions of taxable income. Grey bars represent the reported distribution, while red bars show the filtered distribution obtained using the method of Bertanha et al. (2023), which fits a 7th-degree polynomial to the empirical CDF, excluding observations within a 12.5% window around the kink and allowing a discontinuous shift at the kink. The friction-free CDF is derived by extrapolating the polynomial into the excluded region. The bunching mass is estimated as the difference in the share of firms at the kink under the filtered and counterfactual distributions (from 2010). Histograms are plotted using 2,000 CAD bins for visual clarity; ECDF estimates use 250 CAD bins. $\hat{b}_{2005}$ and $\hat{b}_{2006}$ denote the estimated excess masses; $\hat{\epsilon}_{1-\tau^c}$, $\hat{\epsilon}_{1-\tau^d}$ and $\hat{\theta}$ denote the corporate tax elasticity, the dividend tax elasticity and the corporate veil index, respectively. Standard errors (in parentheses) are obtained via bootstrap resampling from the filtered distribution, in line with Bertanha et al. (2023).

To address whether our results are robust to this movement of bunching mass, we apply the filtering procedure developed by Bertanha et al. (2023) to recover the distribution of taxable profits free of friction errors. The method involves fitting a seventh-degree polynomial to the empirical CDF of reported taxable income, excluding observations within a 12.5% window around the kink. Crucially, the approach allows for a discontinuous intercept shift at the kink, resulting in a jump in the fitted CDF that captures the bunching mass, consistent with predictions from a frictionless model. This estimated CDF then serves as the basis for recovering the underlying error-free corporate income distribution, π. The results of this procedure are presented in Figure 6.

As shown in Figure 6, the filtering procedure leads to increased bunching mass at the kink. For 2005, this sharp bunching mass implies an estimated ECTI with respect to the corporate net-of-tax rate on 0.812, in line with our baseline results. For 2006, we observe a decrease in sharp bunching, and an estimate ECTI with respect to the dividend tax rate of 0.225. These estimates imply a corporate veil index of 0.325, consistent with our baseline estimates.

6.2.4 Polynomial strategy

Finally, we estimate the relevant elasticities using the traditional polynomial strategy first introduced by Chetty et al. (2011). This method fits a high-degree polynomial to the observed income distribution, excluding a window around the kink. The width of this excluded region is chosen based on assumptions about the magnitude of optimization frictions. The fitted polynomial is then extrapolated into the excluded window to construct a counterfactual distribution, i.e., the distribution that would have prevailed in the absence of the kink-induced behavioral response.

While widely adopted, this approach has well-documented limitations. Bertanha et al. (2023) shows that it generally fails to recover either the true bunching mass or the correct counterfactual distribution. This failure stems from two main issues. First, taxable income is measured with error, and inferring its true distribution from noisy data requires deconvolution methods that remain underdeveloped. Second, even if the true, error-free distribution were known, the counterfactual density in the region near the kink would still be unidentified.

Further critiques arise from theoretical examples. Bertanha et al. (2021), in a stylized setting with uniformly distributed abilities, shows that the polynomial method can produce a perfect fit to the observed distribution and yet still yield biased estimates of the bunching mass and the counterfactual distribution. Similarly, Blomquist et al. (2021) argue that using high-order polynomials effectively imposes strong, untested assumptions about preferences or technology that lack empirical grounding. In light of these concerns, we view our preferred method, relying on an empirical counterfactual, as a more transparent and data-driven alternative.

Despite these concerns, we implement this method to facilitate comparison with the existing literature. We estimate the excess mass using polynomial degrees ranging from 1 to 10, and report the resulting estimates in Table 5.

Table 5 reveals that the estimated elasticities are quantitatively sensitive to the degree of

Table 5: Estimates of the relative excess bunching for 2005 and 2006 under alternative polynomial counterfactual distributions.

q	$\hat{b}_{2005}$	$\hat{b}_{2006}$	$\hat{b}_{2005} - \hat{b}_{2006}$	$\hat{\epsilon}_{1-\tau_c}$	$\hat{\epsilon}_{1-\tau_d}$	$\hat{\theta}$
1	26.306	19.073	7.233	0.748	0.32	0.427
	(0.405)	(0.401)	(0.599)	(0.012)	(0.026)	(0.031)
2	24.531	21.83	2.701	0.698	0.119	0.171
	(0.51)	(0.714)	(0.856)	(0.015)	(0.038)	(0.052)
3	24.583	20.69	3.892	0.699	0.172	0.246
	(0.436)	(0.646)	(0.788)	(0.012)	(0.035)	(0.047)
4	20.133	18.807	1.326	0.573	0.059	0.102
	(0.494)	(0.926)	(1.036)	(0.014)	(0.046)	(0.079)
5	20.086	16.376	3.71	0.571	0.164	0.287
	(0.559)	(0.906)	(1.042)	(0.016)	(0.046)	(0.076)
6	18.01	16.647	1.363	0.512	0.06	0.118
	(0.568)	(1.041)	(1.123)	(0.016)	(0.05)	(0.096)
7	18.109	14.204	3.905	0.515	0.173	0.335
	(0.584)	(1.316)	(1.503)	(0.017)	(0.066)	(0.127)
8	15.808	13.455	2.353	0.45	0.104	0.231
	(0.576)	(1.325)	(1.469)	(0.016)	(0.065)	(0.144)
9	15.808	13.455	2.353	0.45	0.104	0.231
	(0.572)	(1.48)	(1.553)	(0.016)	(0.069)	(0.152)
10	15.8	13.444	2.356	0.449	0.104	0.232
	(0.631)	(1.768)	(1.797)	(0.018)	(0.079)	(0.176)

Note: This table shows the sensitivity of our estimates to the choice of the degree of the polynomial used to construct the counterfactual. $\hat{b}_{2005}$ and $\hat{b}_{2006}$ represent the estimated relative excess masses in 2005 and 2006, respectively. $\hat{\epsilon}_{1-\tau^c}$ and $\hat{\epsilon}_{1-\tau^d}$ denote the estimated elasticities of corporate taxable income with respect to the corporate and dividend net-of-tax rates, respectively. $\hat{\theta}$ is the estimated corporate veil index, defined as the ratio of $\hat{\epsilon}_{1-\tau^d}$ to $\hat{\epsilon}_{1-\tau^c}$. Bootstrapped standard errors are reported in parentheses.

the fitted polynomial. Specifically, $\hat{\epsilon}_{1-\tau^c}$ ranges from 0.449 to 0.748, while $\hat{\epsilon}_{1-\tau^d}$ varies between 0.059 and 0.320. As a result, the implied structural parameter $\hat{\theta}$ spans from 0.102 to 0.427. Despite this variation, our core qualitative conclusion remains robust: the distortionary effect of corporate taxes is consistently much larger than that of dividend taxes. This pattern holds across all polynomial specifications, and is further reinforced by the broader set of robustness checks discussed in the previous sections.

Taken together, these results highlight the drawbacks of the polynomial method — already subject to well-documented theoretical critiques — but also demonstrate that our main conclusions are not driven by the choice of estimation strategy. Indeed, across all relevant exercises, our conclusions remain stable both in direction and economic significance.

6.3 Contrast with previous corporate ECTI estimates for Canada

We identify two previous studies that estimate ECTI for Canada. First, Lesica (2025) estimate the corporate ECTI between 2001 and 2019 using the polynomial method to estimate the counterfactual corporate taxable income distribution, reporting elasticities of 0.24 for 2005 and 0.18 for 2006. As we discuss in this paper, the 2006 estimate incorporates two kinks, the corporate tax kink and the dividend tax kink, which generate opposing economic incentives. This may account for the lower ECTI observed in that year. It is also important to note that Lesica (2025) use statutory corporate tax rates of 0.186 and 0.342. However, these rates apply only for taxable income above the provincial small business deduction thresholds, which activates at either 350,000 or 400,000 CAD depending on the province. Since we focus exclusively on the federal threshold, we use tax rates of 0.186 and 0.2762, where the latter reflects the sum of the general federal corporate rate (0.2212) and the provincial rate (0.055) applicable between the federal and provincial thresholds. Using a seventh-degree polynomial and the tax rates from Lesica (2025), we estimate a corporate ECTI of 0.28 and 0.223 for 2005 and 2006, respectively.

In a previous study, Bernier and Perrault (2023) estimate corporate ECTIs for various Canadian provinces between 2009 and 2020. They employing the method proposed by Bertanha et al. (2023), which involves applying the previously discussed filtering procedure, and reframing the bunching design as a censored regression model. Concretely, they use a mid-censored Tobit model to identify the elasticity using data truncated in an interval around the kink point, estimating an ECTI of 0.87 for Ontario.[17] Overall, the findings of Bernier and Perrault (2023) are consistent with our corporate ECTI estimates.

[17]Bernier and Perrault (2023) reports that this elasticity ranges from 0.26 in New Brunswick to 1.43 in Alberta, with a median elasticity of 0.79 for CCPCs at the $500,000 kink during the years 2010-2017.

7 Policy implications: Integration and economic efficiency

As highlighted in the introduction, the 2006 reform was motivated in part by concerns over the double taxation of corporate income. Specifically, the reform reduced the effective taxation of dividends by increasing the degree of integration between corporate and personal taxes, thereby lowering the overall tax burden on equity. This approach reflects a broader international trend, as tax integration has long been a popular policy tool to address the double taxation of corporate income. Countries such as Australia, New Zealand, Norway, Finland, Sweden, Denmark, and Chile have all implemented either full or partial integration mechanisms aimed at achieving similar objectives.

Even countries that operate under a "classic system" allowing for the double taxation of corporate income have often pursued targeted reforms to mitigate its effects. A prominent example is the United States, where the challenge of double taxation has long been central to tax policy debates. The 1992 U.S. Treasury report "Integration of the Individual and Corporate Tax Systems" laid out a comprehensive framework for aligning corporate and personal taxation, and has since served as a key reference point in discussions on tax integration.[18] These ideas notably shaped the 2003 U.S. tax reform proposal introduced by president George W. Bush, which included measures aimed at eliminating investor-level taxes on dividends paid out of after-tax corporate earnings and allowing basis adjustments for retained earnings. Specifically, the proposal sought to exempt dividends from personal taxation if they were distributed from earnings already taxed at the corporate level, and to permit investors to adjust the basis of their shares to reflect retained earnings that had been taxed at the firm level.

The intellectual foundation for these reforms lies in the proposed benefits of integration, which is argued to promote a more neutral tax system by reducing opportunities for tax planning and strengthening incentives for corporate investment (Hubbard, 1993; Smart, 2017). From this perspective, integration serves as a policy tool to mitigate the distortionary effects of corporate taxation. Specifically, proponents contend that integration can benefit the economy through four key channels (Hubbard, 1993, 2005): (i) increased investment driven by a lower user cost of capital; (ii) improved capital allocation through

[18] U.S. Department of the Treasury (1992) outlines several integration prototypes, including the dividend exclusion method, the shareholder allocation approach, and the comprehensive business income tax. Canadas long-standing gross-up and credit system, introduced in 1972, resembles an imputation scheme whereby dividend tax credits are granted irrespective of whether the underlying income was actually subject to corporate taxation Smart (2017).

neutral tax treatment of corporate and noncorporate investment; (iii) a more balanced capital structure between debt and equity, reducing financial risk and inefficiency; and (iv) a reduction in the tax penalty on dividends, encouraging firms to distribute excess funds that can be reinvested in more productive ventures elsewhere. All of those channels can improve economic efficiency.

However, despite extensive theoretical discussion on the advantages of integration, empirical evidence on its efficiency effects remains limited. To help fill this gap, we conduct an illustrative positive exercise, estimating the marginal excess burden (MEB) associated with both corporate and dividend taxes following the 2006 reform. The objective of this exercise is to assess whether greater integration can effectively offset the adverse efficiency effects of corporate taxation.

Our analysis follows Devereux et al. (2014), as we work under the notion that profits, at some point, are distributed as dividends, which means corporate tax revenues are offset by the dividend tax credit. Specifically, we compute the MEB of each tax instrument after the reform, by focusing on firms that declare taxable income above a threshold $\bar{\pi}$. The MEB formulas are given by

$$MEB_{\tau_c} = \frac{\epsilon_{1-\tau_c} \cdot \alpha \cdot \tau_c}{1 - \tau_c - \epsilon_{1-\tau_c} \cdot \alpha \cdot \tau_c}, \quad MEB_{\tau_d} = \frac{\epsilon_{1-\tau_d} \cdot \alpha \cdot \tau_d}{1 - \tau_d - \epsilon_{1-\tau_d} \cdot \alpha \cdot \tau_d} \tag{16}$$

These MEB formulas are in line with the analysis of Saez et al. (2012), who define it as the negative ratio of the behavioral effect of taxes to the combined mechanical and behavioral effect of taxes. In this context, the mechanical effect refers to the increase in revenue in the scenario in which firms do not change their behavior in response to a tax increase. On the other hand, the behavioral effect refers to the forgone revenue due to changes in economic activity due to higher taxes. Thus, the MEB measures the additional cost imposed by the government for each dolar raised.

Using these formulas, we calculate the MEB for each tax instrument for the top bracket in the post-reform period of 2006. Using our baseline income elasticities, a corporate tax rate of 27.62%, a dividend tax rate of 25.31%, and an α of 1.08, as in Devereux et al. (2014), we obtain $MEB_{\tau_c} = 0.532$ and $MEB_{\tau_d} = 0.138$. These results suggest that cost of dividend taxation is about 0.259 times that of corporate taxation. This relative cost is slightly lower than our corporate veil index, due to the fact that the dividend tax rate in the upper bracket are slightly lower than corporate tax rate (0.2531 vs 0.2762), leading to an overall lower MEB.

Two key lessons emerge from these calculations. First, raising revenue through the corporate tax rate is significantly more costly than through the dividend tax rate. This suggests that while increased integration can yield moderate efficiency gains, it does not fully offset the distortionary effects of corporate taxation. In contrast, our estimates indicate that lowering corporate taxes directly is a more economically sound approach to reducing the efficiency costs of taxation. Second, higher integration, particularly in the context of Canadian-Controlled Private Corporations (CCPCs), is a regressive policy, as CCPC owners are predominantly individuals in the upper tail of the income distribution (Wolfson et al., 2016). Indeed, as Wolfson et al. (2016) show, top income shares rise substantially when CCPC income is included in measures of Canadian income distribution. As a result, greater integration disproportionately benefits top earners through tax credits, while offering only limited efficiency gains.

8 Conclusion

This paper has examined firms' behavioral responses to corporate and dividend taxes, using the 2006 Canadian dividend tax reform to estimate the ECTI with respect to both tax instruments. Our findings indicate that firms are significantly more responsive to corporate tax rates than to dividend tax rates, with an ECTI of 0.843 for the corporate net-of-tax rate and 0.249 for the dividend net-of-tax rate. These results suggest that firms sensitivity to corporate tax changes is roughly four times higher than to dividend tax changes. In light of these findings, the issue of double taxation becomes even more pressing. Double taxation, where corporate profits are taxed both at the corporate level and again when distributed as dividends, creates strong incentives for tax planning and avoidance, diverting resources away from productive investments. To address these distortions, many countries have adopted tax integration systems like Canadas imputation credit, which mitigates the burden of double taxation by allowing shareholders to credit taxes paid at the corporate level against their personal tax liabilities. However, our analysis suggests that simply focusing on integration is not enough; it is also critical to consider the differential effects of corporate and dividend tax rates.

The welfare implications of these differential responses are significant. We estimate that raising revenue through corporate taxes is 4 times more costly in terms of MEB than doing so through dividend taxes. This suggests that policymakers should focus more on reducing corporate tax rates rather than dividend tax rates if the goal is to minimize economic distortions. While tax integration addresses some of the inefficiencies associated with double taxation, the optimal policy mix would involve a careful balance of corporate and dividend taxation, with greater emphasis on lowering the corporate tax burden.

While our analysis provides important insights, several avenues for future research remain open. First, although our study focuses on the Canadian imputation credit system, it would be valuable to examine whether similar patterns of tax responsiveness hold in other countries with different tax regimes, such as those that employ partial credit or exemption systems. Comparative studies could provide a broader understanding of how tax integration mechanisms influence firm behavior across different institutional contexts.

Second, we do not explicitly model the source of firms' lack of salience regarding the dividend tax schedule. The Canadian dividend tax system is notably complex, relying on multiple parameters, and in our case study, the reduction in the effective dividend tax rate was achieved through an increase in the dividend tax credit and the gross-up rate. Given that there are several ways to adjust the effective dividend tax rate, an important question arises regarding which method is the most (or least) salient to taxpayers. Future research should explore how firms and individuals respond to different tax instruments in such complex tax environments, particularly in terms of salience and behavioral reactions.

Finally, this study focuses on small Canadian firms (CCPCs). It would be useful to extend this analysis to larger firms and multinationals, which may have different sensitivities to tax rates due to factors such as international tax planning opportunities and access to more extensive capital markets. Understanding how firm size and cross-border tax considerations shape tax responsiveness could inform the design of more nuanced tax policies.

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Appendix

A1 Model with a kink

Our model assumes ex-ante heterogeneity in firm behavior. Concretely, we assume a mass λ of firms which behave according to the old view of dividend taxation, i.e., $f'(I) = \frac{r}{(1-\tau_c)(1-\tau_d)}$. The remaining $1-\lambda$ share of firms ignore personal taxes, in line with the new view: $f'(I) = \frac{r}{(1-\tau_c)}$.

Our model extends the literature by including a double kink in both the corporate and dividend tax schedule. That is, at some taxable income level π^*, the corporate tax rate shifts from $\tau_{c,0}$ to $\tau_{c,1}$, while the dividend tax rate changes from $\tau_{d,0}$ to $\tau_{d,1}$. We assume that the effective tax rate on equity is positive, creating a convex kink that causes a mass of firms to bunch at the threshold π^*. Moreover, we assume a isoelastic profit function:

$$f(I) = A\left(\frac{1+\epsilon}{\epsilon}\right) I^{\frac{\epsilon}{\epsilon+1}} \tag{17}$$

New view firms

We first characterize the behavior of new view firms. A well known result in the literature of nonlinear taxation is that discontinuities in marginal tax rates creates and mass of bunching agents. Thus, we find three types of firms in this scenario: (i) firms below the kink with an interior solution; (ii) firms that choose the corner solution and bunch at the kink point; and (iii) firms above the kink with an interior solution. Formally, the solution for new view firms is given by

$$\pi_{\mathrm{n}} = \begin{cases} A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,0})^{\epsilon} & \text{if } A < \underline{A}_{\mathrm{n}} \\ \pi^* & \text{if } A \in \left[\underline{A_n}, \overline{A_n}\right] \\ A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,1})^{\epsilon} & \text{if } A > \overline{A_n} \end{cases}$$

where

$$\underline{A_n} = \left(\frac{\pi^*}{\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,0})^{\epsilon}}\right)^{\frac{1}{1+\epsilon}}, \quad \overline{A_n} = \left(\frac{\pi^*}{\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,1})^{\epsilon}}\right)^{\frac{1}{1+\epsilon}}$$

Next, consider the problem of the marginal buncher across new view firm. This corresponds to the new view firm with highest productivity that bunches. Let us denote its productivity by $A_{\mathrm{n}} + \Delta A_{\mathrm{n}}$ and their taxable income under the linear tax schedule by $\pi^* + \Delta\pi^*_{\mathrm{n}}$. Thus, the relative change in taxable income for this firm under the nonlinear and linear tax schedule will be given by

$$\frac{\Delta\pi^*_{\mathrm{n}}}{\pi^*} + 1 = \left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right)^{\epsilon}$$

Under the assumption that $\frac{\Delta\pi^*_{\mathrm{n}}}{\pi^*}$ is small, a first-order Taylor approximation yields:

$$\frac{\Delta\pi^*_{\mathrm{n}}}{\pi^*} = \epsilon \log\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right) \tag{18}$$

Thus, for new view firms, the relative change in taxable income is given by the product of the structural elasticity ϵ and the percentage change in corporate taxes, where dividend taxes are not relevant to the analysis.

Old view firms

The solution for old view firms is similar, with the difference that they are responsive to dividend taxes:

$$\pi_{\mathrm{o}} = \begin{cases} A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,0})^{\epsilon}(1-\tau_{d,0})^{\epsilon} & \text{if } A < \underline{A_{\mathrm{o}}} \\ \pi^* & \text{if } A \in [\underline{A_o}, \overline{A_o}] \\ A^{\epsilon+1}\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,1})^{\epsilon}(1-\tau_{d,1})^{\epsilon} & \text{if } A > \overline{A_o} \end{cases}$$

where

$$\underline{A_o} = \left(\frac{\pi^*}{\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,0})^{\epsilon}(1-\tau_{d,0})^{\epsilon}}\right)^{\frac{1}{1+\epsilon}}, \quad \overline{A_o} = \left(\frac{\pi^*}{\left(\frac{\epsilon+1}{\epsilon}\right)\left(\frac{1}{r}\right)^{\epsilon}(1-\tau_{c,1})^{\epsilon}(1-\tau_{d,1})^{\epsilon}}\right)^{\frac{1}{1+\epsilon}}$$

Which in turn yields the following expression for the relative change in taxable income:

$$\frac{\Delta\pi^*_{\mathrm{o}}}{\pi^*} = \epsilon \log\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right) + \epsilon \log\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}}\right) = \epsilon \log\left[\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}}\right)\left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}}\right)\right]. \tag{19}$$

Given that for the old view firms $\epsilon^{o}_{1-\tau_d} = \epsilon$. Thus, for old view firms, the relative change in taxable income is given by the product of the structural elasticity and the relative change in the effective rate on equity.

Definitions and assumptions

We first describe precisely the concept of bunching. Concretely, the bunching mass is defined as the share of firms that locate at the kink under the nonlinear tax schedule. Formally, let $g_{\text{o}}(\pi)$ and $g_{\text{n}}(\pi)$ denote the counterfactual density function of taxable profits for old and new view firms. Then, the mass of bunching new view firms and old view firms will be given by

$$B_{\text{n}} = \int_{\pi^*}^{\pi^* + \Delta\pi^*_{\text{n}}} g_{\text{n}}(v)dv, \qquad B_{\text{o}} = \int_{\pi^*}^{\pi^* + \Delta\pi^*_{\text{o}}} g_{\text{o}}(v)dv \tag{20}$$

furthermore, let $g(v)$ denote the counterfactual distribution across all firms and B be the total bunching mass composed of both firm types. Next, we discuss the assumptions needed for identification.

Assumption 1 (Uniformity)**.** *The counterfactual distributions of taxable income of new view firms, $g_n(z)$, and of old view firms $g_n(z)$ are both uniform around the kink:*

$$B_o = \int_{\pi^*}^{\pi^* + \Delta\pi^*_o} g_o(v)dv \approx g_o(\pi^*)\Delta\pi^*_o, \qquad B_n = \int_{\pi^*}^{\pi^* + \Delta\pi^*_n} g_n(v)dv \approx g_n(\pi^*)\Delta\pi^*_n \tag{21}$$

As highlighted by Bertanha et al. (2023) and Blomquist et al. (2021), point identification of the ETI using the bunching estimator is not feasible without placing restrictions on the counterfactual income distribution. Thus, we rely on the assumption that both counterfactual distributions are uniform, as in Chetty et al. (2011). This assumption allows us link the bunching mass to the tax elasticities through proposition 1.

Assumption 2 (Stationarity)**.** *The kink threshold π^* and the structural elasticity ϵ are time invariant, while the counterfactual distributions of taxable income $g_o(v)$ and $g_n(v)$ are stationary.*

This assumption ensures the consistency of the system of equations and the existence of a solution. Concretely, if the structural elasticity ϵ changes from one year to the next while the tax structure remains unchanged, the result would be an inconsistent set of equations, as two distinct bunching moments would correspond to the same weighted sum of elasticities. Crucially, this assumption can be directly tested by verifying whether the elasticity estimates remain stable across years provided that there are no changes in the tax structure.

Before introducing our final assumption, we introduce notation to distinguish between observed moments before and after the reform. Concretely, let B^0 and B^1 denote the observed bunching moments before and after the reform, respectively, and let $\tau^0_{k,l}$ and $\tau^1_{k,l}$ represent the corresponding tax rates, where $k \in \{c, d\}$ and $l \in \{0, 1\}$.

Assumption 3 (Linear independence)**.** *The government introduces a tax reform that yields two linearly independent equations:*

$$\frac{B^0}{\pi^* g(\pi^*)} = \epsilon_{1-\tau_c} \log\left(\frac{1-\tau^0_{c,0}}{1-\tau^0_{c,1}}\right) + \epsilon_{1-\tau_d} \log\left(\frac{1-\tau^0_{d,0}}{1-\tau^0_{d,1}}\right) \tag{22}$$

$$\frac{B^1}{\pi^* g(\pi^*)} = \epsilon_{1-\tau_c} \log\left(\frac{1-\tau^1_{c,0}}{1-\tau^1_{c,1}}\right) + \epsilon_{1-\tau_d} \log\left(\frac{1-\tau^1_{d,0}}{1-\tau^1_{d,1}}\right) \tag{23}$$

This assumption is needed to obtain a unique solution to the system of linear equations. Notably, it restricts the type of tax reforms that allows us to identify the elasticities. In particular, if the government introduces a tax reform that yield a set of linearly dependent equations, then the system will be underdetermined and we will not be able to point-identify the elasticities.[19]

Proofs

Proof of Proposition 1. Let us recall that λ denotes the share of old view firms. Using the law of total probability and Assumption 1 we can express total bunching as

$$B = \lambda B_{\text{o}} + (1-\lambda) B_{\text{n}} = \lambda g_{\text{o}}(\pi^*)\Delta\pi^*_{\text{o}} + (1-\lambda) g_{\text{n}}(\pi^*)\Delta\pi^*_{\text{n}} \tag{24}$$

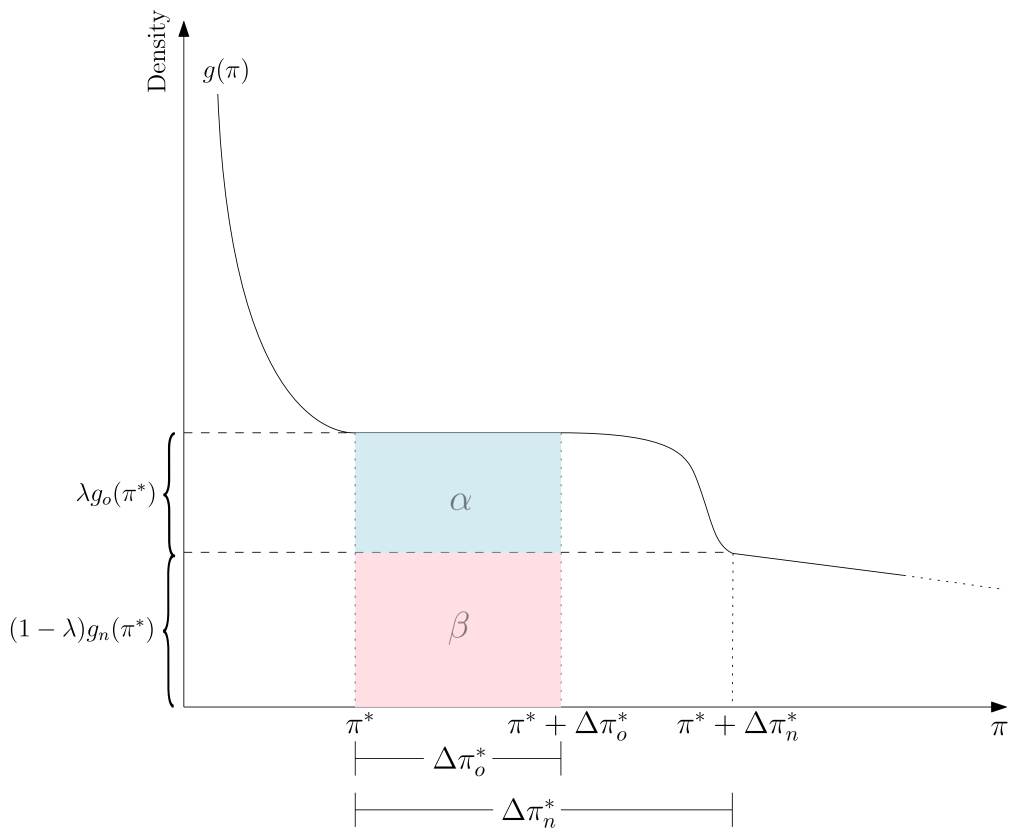
Dividing by $g(\pi^*)$ yields

$$\frac{B}{g(\pi^*)} = \frac{\lambda g_{\text{o}}(\pi^*)}{g(\pi^*)}\Delta\pi^*_{\text{o}} + \frac{(1-\lambda) g_{\text{n}}(\pi^*)}{g(\pi^*)}\Delta\pi^*_{\text{n}} \tag{25}$$

[19] This would happen, if, for example, the government doubles the relative change in the net-of-tax rates across the kink for both tax instruments.

Using Bayes theorem, we know that $\theta \equiv \frac{\lambda g_{\text{o}}(\pi^*)}{g(\pi^*)} = \Pr(\text{Old}|\pi^*)$, while $1-\theta \equiv \frac{(1-\lambda)g_{\text{n}}(\pi^*)}{g(\pi^*)} = \Pr(\text{New}|\pi^*)$. However, due to the uniformity of the conditional distributions, the prior parameter can be also expressed as the share of old view firms in the overlapping bunching area: $\theta = \Pr(\text{Old}|\pi \in [\pi^*, \pi^* + \min\{\Delta\pi^*_{\text{o}}, \Delta\pi^*_{\text{n}}\})$, where $\pi^* + \min\{\Delta\pi^*_{\text{o}}, \Delta\pi^*_{\text{n}}\}$ denotes the overlapping bunching region, i.e., the bunching windows that features both old and new view firms that bunch. In our context, the kinks in the corporate and dividend tax schedules are convex, and non-convex respectively, implying that $\Delta\pi^*_{\text{o}} < \Delta\pi^*_{\text{n}}$. To see why the previous equality in probability holds, consider the following figure, adapted to the tax system following the reform:

Figure A1: Interpretation of θ



In this scenario, $\theta = \frac{\alpha}{\alpha+\beta}$, i.e. the local share of firms in the $[\pi^*, \pi^* + \Delta\pi^*_{\text{o}}]$ interval. Notably, this result is a direct consequence of the uniformity assumption, which ensures that the total density $g(\pi)$ is also uniform in that area. These identities imply that the observed relative bunching reflects an average response in firm profits, in line with Kleven (2016):

$$\frac{B}{g(\pi^*)} = \theta\Delta\pi^*_{\text{o}} + (1-\theta)\Delta\pi^*_{\text{n}} = \overline{\Delta\pi^*}, \tag{26}$$

which shows the first equality of Proposition 1. Next, we divide by π^* with the aim of relating the elasticities to the observed bunching mass:

$$\frac{B}{\pi^* g(\pi^*)} = \theta \frac{\Delta \pi^*_{\mathrm{o}}}{\pi^*} + (1-\theta)\frac{\Delta \pi^*_{\mathrm{n}}}{\pi^*} \tag{27}$$

$$= \theta \epsilon \log \left[\left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}} \right) \left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}} \right) \right] + (1-\theta)\epsilon \log \left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}} \right) \tag{28}$$

$$= \epsilon \log \left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}} \right) + \theta \epsilon \log \left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}} \right) \tag{29}$$

$$= \epsilon_{1-\tau_c} \log \left(\frac{1-\tau_{c,0}}{1-\tau_{c,1}} \right) + \epsilon_{1-\tau_d} \log \left(\frac{1-\tau_{d,0}}{1-\tau_{d,1}} \right) \tag{30}$$

where $\epsilon_{1-\tau_c} \equiv \epsilon$ and $\epsilon_{1-\tau_d} \equiv \theta\epsilon$, which concludes the proof. ■

Proof of Proposition 2. This results follows directly from Proposition 1, and Assumptions 2 and 3, which ensure that the system of equations has a unique solution. ■