Business Organization and Taxation of High-Income Professionals: Evidence from Canadian Doctors

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Abstract

Small businesses including high-income professionals choose to operate as corporations or pass-through entities such as sole proprietorship on the basis of non-tax and tax considerations. Incorporation may offer businesses lower effective tax rates on income earned and distributed to the owner-manager, as well as opportunities to defer taxes to the future. We show how taxes affect labor and investment decisions over the life cycle and derive a "sufficient statistics" formula for the impact of incorporation on social welfare. Using longitudinal administrative tax data from 2001 to 2017, we study the businesses of Canadian physicians and dentists. We identify the causal effects of taxes using a triple-difference design that exploits a 2006 reform that facilitated incorporation by doctors in Ontario. Incorporation rates in the treated group rose sharply after the reform compared to a matched control group of doctors in other provinces and business owners in other industries. Combined personal-plus-corporate incomes rose initially following the reform and then fell gradually, especially for doctors in their 50s and 60s. Effective tax rates fell marginally, mainly due to the shifting of income to family members. Doctors accumulated substantial retained earnings inside their corporations, suggesting they are used as deferred-tax retirement savings vehicles. Employment and business investment rose from a small base. Taken together, these results are consistent with both tax avoidance through a corporation and real response via increased labor supply and some business expansion after incorporation.

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1 Introduction

Firms are the key way of organizing economic activities, and their behavior is tied to preferences of their owners. While economists often assume profit maximization on the firm level, an entrepreneur is likely to trade off monetary profits against personal considerations such as dis-utility of labor, volatility of consumption, or tax implications not just for the firm but for themselves as well. This paper studies how individuals respond to an option to incorporate a business. A corporation is a legal form that grants limited liability and comes with a set of legal and accounting restrictions. Our setting is Canada, where corporations are subject to a corporate tax and our key interest is understanding the implications of replacing personal income tax treatment of unincorporated businesses by corporate tax treatment. This choice also exists in other countries including the United States where firms have a broader menu of options through corporate (or other limited liability) pass-through entities.

The key tax planning aspect of corporate tax treatment is deferral. While a firm is subject to annual corporate tax, its profits are not recognized as owners' income until the firm pays dividends or owners sell their share and realize capital gains. Deferral can be beneficial if returns earned within a firm are effectively taxed at lower rate than those in personal taxable accounts or if taxation on realization corresponds to lower effective tax rate (as is often true with capital gains). Additionally, a corporation can provide other tax advantageous opportunities such as the ability to shift income to family members by employing them or providing ownership stake, strategies related to tax treatment of capital assets, the ability to manipulate costs, and the ability to re-time when income is received.

In this paper, we study the impacts of tax incentives designed to induce incorporation on business owners' total income, tax liabilities, and real economic activities at the family level. In particular, we evaluate the 2006 reform in Ontario which stimulated incorporation by providing regulatory clarity for ownership of medical corporations and allowing doctors' family members to own shares in these businesses. To estimate the causal impacts of the policy, we use a triple-difference design, where we compare the outcomes of doctors in Ontario with the outcomes of doctors in other provinces, and make the same comparisons for other high-income professionals. To observe and keep track of owners' income, tax liabilities, and business activities, we link datasets on their ownership of incorporated and/or unincorporated businesses along with their family tax files and firm balance sheet information from 2001 to 2017. Since the administrative data links tax records of individuals with their family members and businesses that they own, we can comprehensively observe household income (important for understanding income shifting within a family), income from all sources in-

cluding that retained in closely held businesses, tax liability including individual income taxes, capital gains taxation, business-side taxation, and some aspects of real business activities (i.e., employment and capital investment). This rich data environment is crucial in the context where doctors can incorporate and represent income that was previously reported as individual professional income, but now gives rise to business revenue and profits instead.

We show that the reform substantially increased the rate of incorporation by doctors. We find strong evidence of income shifting from the personal side to the corporate form after incorporation: doctors in Ontario significantly reduced their personal income and started deferring their new corporate profits as retained earnings relative to their control group. Doctors in Ontario shifted their income to their spouses through spousal hires or giving ownership stake in the firm. Furthermore, investment in medical equipment and sales increased for doctors in Ontario relative to their control group after the reform, providing evidence of business expansions. Overall, these changes led to significant increases in their total taxable income, most likely due to increased doctors' own labor supply but also with the role for investment and employment, with modest reductions in average effective tax rates. Taken together, our findings reflect behavioral responses beyond a simple reallocation.

The average effects mask some heterogeneity across demographics and by occupations. As we discuss in our model (Section 3), we expect that the policy would have an impact on overall income through expansion of business activities due to the intertemporal substitution of labor, with the corresponding build-up of savings via deferred corporate income (i.e., retained earnings), because the tax benefits of incorporation makes optimal lifetime consumption and labor paths steeper. While we do not find strong heterogeneity by gender, we find significant heterogeneity across age cohorts in their overall income, total taxes paid, and retained earnings, especially between the youngest cohort and oldest cohort. We find that younger cohorts experience larger increases in overall income, taxed paid, and retained earnings relative to older cohorts. These results are consistent with the intertemporal substitution of labor and predictions from our model, because the younger doctors have more incentives to work more earlier in their life to take advantage of higher returns on saving inside the firm. We also find heterogeneity by occupation. There is much stronger evidence of business expansion via investment for dentists and stronger reliance on accumulation of retained earnings for physicians, consistently with dental clinic being more capital intensive than medical practices in Canadian settings and supporting the notion that labor supply doctors in Canada has more room to respond, perhaps due to regulated pricing of their services.

We provide a theoretical framework that clarifies incentive effects, in particular those

for labor supply, and a a Marginal Cost of Funds-based welfare framework that allows for summarizing and quantifying welfare consequences of owning a corporation. In particular, we show that the welfare costs of tax deferral can be estimated, to a first-order approximation, by measuring the long-run effects of deferral on government revenue alone, i.e. the "fiscal externality" from tax deferral. The marginal excess burden of a tax is, under fairly general conditions, equal to its marginal effect on government revenue through behavioral channels. Using this idea, Hendren and Sprung-Keyser (2020*a*) proposed simple rules for evaluating the welfare impacts of a wide variety of policies based on a minimal set of elasticities and tax–transfer parameters. We show how these insights can be applied to evaluating tax avoidance through incorporation and deferral, even in complex, dynamic environments.

The incorporation reform leads to large increases in doctors' total incomes, alongside a decline in tax revenues. On average, treated doctors' incomes rise about 7,500 dollars per year with the reform, while net tax revenues fall by approximately 1,200 dollars per doctor annually. These patterns are consistent with substantial real behavioral responses to lower effective marginal tax rates on both labor income and savings within the corporate form. To understand the welfare implications of these results, we decompose the effect on tax revenues into mechanical and behavioral components. Using our framework, the behavioral revenue effect is constructed as the treatment effect on total income multiplied by the relevant personal marginal tax rate, capturing the additional tax revenue that would have been collected in the absence of income shifting into the corporate sector. The mechanical effect is then the residual difference between the observed change in tax revenue and this behavioral component. For the full sample, we estimate a behavioral revenue effect of approximately 3,500 dollars per doctor, and a mechanical revenue loss of about 4,700 dollars. The resulting MVPF of the reform is 3.9, reflecting large income gains relative to the modest net fiscal cost. This decomposition highlights that most of the fiscal cost arises from income shifting rather than real reductions in taxable income.

While these results indicate sizable efficiency gains from the reform, the ultimate social impact of the reform depends on the welfare weight ascribed to transfers to these high-income individuals. Nearly all treated doctors in our sample are in the top marginal tax bracket of the income tax system, and most are in the top one percent of the distribution of fiscal income. Estimates in Hendren and Sprung-Keyser (2020*b*) indicate that top-bracket tax reductions in the United States have an MVPF of 1.85 or more. The correspond estimates are likely higher in Canada, where top-bracket marginal tax rates are somewhat higher also. It therefore appears safe to conclude that reforms facilitating incorporation by high-income professionals like doctors are socially desirable.

There exist three distinct literature that this paper relates to. First, our welfare framework reinterprets an option to incorporate as a change in tax incentives and relates it to the literature on behavioral responses to taxation and taxable income elasticity in particular. Second, by focusing on high income professionals who are an important group at the top of the distribution, we highlight income and tax measurement problems with important distributional implications which require observing both individual and firm sides to address. Third, these tax-related responses reveal how individual and firm decisions interact and contribute to better understanding the nature of these types of firms.

Incorporation offers owner-managers flexibility about the timing of distributions from the firm and, in some cases, tax advantages that flow from deferral of tax liabilities. Tax deferral through small business corporations may be advantageous if it lowers the user cost of capital for reinvested earnings. If income deferred for tax purposes is eventually taxed at the same tax rate, however long in the future, then the present value of taxes saved through deferral will be zero – an idea known as the "New View" of Dividend Taxation (Auerbach, 2002). But the New View rests on strong assumptions about the choices facing the firm and the effectiveness of the tax system in controlling tax avoidance. If deferral leads to long-run tax advantages, it raises obvious concerns about the loss of tax revenues and the horizontal inequity in the treatment of business owners and other high-income earners who cannot adopt the corporate form.

Tax deferral also offers incorporated taxpayers opportunities to engage in intertemporal shifting in response to tax reforms (Saez, Slemrod and Giertz, 2012). One prominent example is income shifting between the individual and corporate tax bases, which is possible by choosing an appropriate organizational form, pursuing incorporation, retaining earnings, reclassifying wages as profits, and engaging in various forms of tax avoidance (see Kopczuk, 2023, for discussion). Recent interest in the extent of tax evasion at the top of the distribution has also focused on closely held businesses that tax authorities have difficulty observing (Guyton et al., 2021). The line between business and individual considerations is often blurry or non-existent, especially for closely-held businesses, with business activity potentially mixed with personal consumption and saving objectives of the owners (see e.g., Alstadsæter, Kopczuk and Telle, 2014; Kopczuk and Zwick, 2020; Leite, 2024).

Business organizational forms are closely tied with evolution of income inequality. Smith et al. (2019) showed that the growth of pass-through businesses (partnerships and corporations subject to individual income taxation) in the United States since the 1990s has been the driving force behind the growth of income inequality. The compositional change in organizational forms of business activities that correspond to it has been massive (Clarke and

Kopczuk, 2017) and, yet, poorly understood. Different countries have different legal and tax environments and, as a result, business income can be taxed predominantly at the corporate level, as in Canada and the United Kingdom, or have half or more of it subject to individual income taxation, as in the United States, Germany, and Japan (Clarke and Kopczuk 2017; Joint Committee on Taxation 2013). Behavior and organization form of firms interacts with our ability to measure income and its distribution. Alstadsæter et al. (2026) show that in Norway, accounting for retained earnings within corporate businesses led to doubling the top 1 percent shares in some years when tax incentives favored retention (and had little impact when they did not) and that the standard imputation method can account for only about a half of that share. Tax incentives between corporate and personal taxation and, hence, the desirability of retention changed dramatically in the United States since the early 1980s, exactly during the period of inequality growth. We contribute to this literature by leveraging detailed data that links business owners with ownership information on their incorporated and/or unincorporated businesses as well as their family files that allow us to keep track of income shifting across different tax bases. Importantly, we exploit the reform that allows us to identify the causal impacts of tax incentives for incorporation on their overall income, tax liabilities, and real business activities. Then we use our reduced-form estimates and model framework to estimate the welfare impacts of this policy.

We study doctors in Canada for the following reasons. First, it is a specific example of high-income professionals of the kind that played an important role for growing inequality (Smith et al., 2019; Gottlieb et al., 2023). Second, this is a group known to respond to tax incentives on the incorporation margin in some other countries (Romanov, 2006). These two reasons make it a potentially fruitful area for studying behavioral responses in an important and well-defined context with required data.[1]

This paper is organized as follows. Section 2 provides institutional details regarding professional corporations, tax rules, and the reform in Canada. Section 3 presents our model. Section 4 describes our data, and Section 5 discusses our empirical strategy. Section 6 presents our main results, and Section 7 presents heterogeneity results and discusses policy implications of our findings. Section 8 concludes.

[1]This context is also tied with the political economy of public expenditures: while the Canadian supply of health care is to a large extent private, spending is predominantly public and policy-makers choose to partially compensate physicians through tax breaks, with implications for the true fiscal cost and industrial organization of this important sector. However, we can abstract from these considerations by comparing across provinces and providing corroborating evidence for dentists who are not subject to the same considerations.

2 Institutional Details

2.1 Professional corporations

Businesses in Canada may be organized as corporations or operate in unincorporated form as sole proprietorship or partnership. For regulated professions, including doctors, and lawyers, access to the corporate form has traditionally been restricted in Canada, but regulatory reforms over the past 20 years have liberalized these rules. As in the United States (Gottlieb et al., 2020), doctors in Canada comprise a substantial minority of taxpayers in the top one percent of incomes. Prior to 1996, six out of ten Canadian provinces did not permit medical corporations at all. In provinces where they were permitted, management of and ownership in them had traditionally been restricted to licensed physicians. These rules have been gradually liberalized across provinces and, by 2010, all provinces permitted medical corporations and, additionally, allowed family members of physicians to own shares. The possibility of advantageous taxation of capital income within corporation and of assigning shares to family members are advantages for tax planning that we discuss in detail in the next subsection.

In Ontario, the largest province, doctors and dentists were first permitted to incorporate their practices in 2001. The 2006 reform was enacted in 2006 as part of collective negotiations on compensation between doctors and the provincial medicare plan (Nielsen and Sweetman, 2018). It provided regulatory guidance to professionals and their tax advisers on how to structure their corporate entities and extended non-voting ownership rights to family members (spouses, children and parents of doctors).

By contrast, physicians in British Columbia have been permitted to incorporate and allowed to give non-voting shares to their family members since 1991. Therefore, physicians in British Columbia, along with other smaller provinces such as Saskatchewan and Manitoba, serve as a natural control group to physicians in Ontario. On the other hand, a reform similar to the one in Ontario was implemented in 2010 Alberta and in 2007 Quebec. For this reason, we treat doctors in Alberta and Quebec as separate groups.

Dentists are treated by the same rules in Ontario since 2006. We include them as part of the treated group, but also show separate analyses for physicians and for dentists, as the latter group's service fee system is not regulated by the government.

2.2 Tax rules

Unincorporated businesses receive a flow-through tax treatment; that is, business income flows through to owners as personal income and, with exceptions noted below, is fully taxed on accrual as ordinary income. Incorporated business income, on the other hand, is subject to corporate taxation, and distributions to owners are taxed again at the personal level.[2] However, through Small Business Deductions (SBD), Canadian-controlled private corporations (CCPCs) with assets less than 15 million Canadian dollars are subject to corporation taxes at substantially reduced rates on active business incomes up to $500,000 annually.[3] While tax rates vary by province of corporate residence, the statutory tax rate for small CCPCs averaged around 12 percent in 2020, compared to an average top personal marginal tax rate of 53 percent.[4] The gap between top personal and small business corporate tax rates has widened over time, as federal and provincial governments alike have slashed small business tax rates while increasing marginal rate progressivity in personal income taxes. As such, the value of tax deferral through the corporate form has become larger.

While corporate income is in effect taxed twice, at the corporate and personal levels, the system features a form of corporate-personal tax integration. Dividends from taxable Canadian corporations paid to domestic shareholders are "grossed up" to impute, and a personal tax credit is applied to offset, corporate taxes deemed to already have been paid on the underlying corporate earnings.[5] Thus, the dividend tax credit effectively eliminates double taxation of earnings distributed as dividends, for large and small tax-paying corporations alike. However, the system may lead to undertaxation for corporations with effective tax rates below statutory rates (Smart, 2017), and for shareholders who receive distributions in the form of capital gains rather than as dividends.

Realized capital gains on corporate shares are subject to tax at one-half the shareholder's personal marginal tax rate. In addition, taxpayers are eligible for a lifetime capital gains exemption (LCGE) from taxation of approximately 900,000 dollars on the disposition of

[2]Under the Canadian tax law, there are no fiscally transparent entities like S-corporations in the United States.

[3]The maximum deduction is reduced for corporations with taxable capital over 10 million dollars, falling to zero at taxable capital of 15 million dollars. The income threshold has increased from 200,000 dollars in 2000, or about 70 percent in real terms.

[4]In contrast, large corporations pay the general corporate tax rate, which averages 26 percent across the provinces. Tax rate data reported here are drawn from the Finances of the Nation data project at https://financesofthenation.ca/statutory-tax-rates/.

[5]Since 2006, dividend tax credit rates have differed for "eligible" dividends paid from earnings subject to the general corporate tax rate, and "non-eligible" dividends paid from earnings subject to the low rate, with the two credit rates corresponding to the respective corporate tax rates.

qualified small business shares.[6] Ignoring the LCGE for now, the effective tax rate on corporate earnings distributed as capital gains is therefore

$$\tau_e = \tau_c + .5(1 - \tau_c)\tau_p \tag{1}$$

where τ_c is the statutory corporate tax rate and τ_p the shareholder's personal marginal tax rate. The effective tax rate on income paid out as capital gains has decreased over time relative to other income streams, first with the 1999–2000 federal reform that reduced the capital gains inclusion rate from 75 to 50 percent, and then further with reductions to small business corporate tax rates in the provinces beginning in 2008. Since 2015, federal and provincial top bracket marginal tax rates have increased, leading to a pronounced increase in effective tax rates on salaries and dividends, further widening the gap. Coincident with these tax changes, there has been a marked rise in incorporation of high-income taxpayers in Canada and a resulting decline in unincorporated business income. There has been a steady decline in tax rates since 2000 and a concomitant decline in unincorporated business income.

2.3 Tax Benefits of Incorporation

While the objective of integration is tax neutrality for alternative forms of capital income and forms of business organization, there are reasons to believe that the effective tax rate on earnings of small CCPCs is lower than business owners' personal marginal tax rate on ordinary income. This is particularly true for business owners who use CCPCs as vehicles to earn passive investment income, who engage in "income sprinkling"[7] and surplus stripping"[8] transactions for tax planning purposes, or who use them for estate planning. In principle, the small business deduction is available only for income from active business assets of the

[6]The LCGE for qualified small business shares is 892,218 dollars in 2021. For farm properties, the limit is 1 million dollars.

[7]Income sprinkling refers to the practice of paying salaries or dividends to family members who face a lower personal tax rate than the manager-owner. In Canada, the unit of taxation is the individual rather than the family, so CCPC owners may frequently face higher marginal tax rates than their spouses and children. While there are rules to discourage the practice income sprinkling appears to be widespread (Department of Finance, 2017), leading to a persistent tax advantage to small business owners.

[8]Surplus stripping refers to transactions among related corporations with the effect of characterizing corporate cash distributions to shareholders as capital gains rather than dividends. In the canonical surplus stripping transaction, shares in an operating company with retained earnings are sold to a holding company, resulting in a capital gain to the shareholder. In some circumstances, cash in the holding company can then be paid out to the shareholder as a tax-free return of capital rather than as a dividend. While specific anti-avoidance rules exist under Section 84.1 of the Income Tax Act, they do not apply to all surplus-stripping transactions (Roopra and Saverino, 2020). The resulting distributions face lower capital gains tax rates. In some cases, the taxpayer may also claim the LCGE, exempting the first 1 million dollars of the distribution from tax entirely.

corporation other than certain investment and personal services businesses. Other income is deemed to be passive investment income that is subject to additional taxes. But the passive income rules are complicated, leading to concern that CCPCs are used to reduce taxes on passive investment portfolios as well (Department of Finance, 2017). In particular, until 2017, a taxpayer who paid annual dividends (a situation that fits many physicians who need to finance their current consumption) for any reason and out of any source of corporate income could credit the same year's passive income taxes against personal income tax on dividends, effectively nullifying the impact of the corporate-side passive income top-up tax.

Furthermore, CCPC owners also have certain advantages in estate planning. In Canada, there is no estate tax, but there is deemed realization of capital gains at death. It is common for high-wealth CCPC owners to engage in "estate freeze" transactions that permit the transfer of shares in the business to family members without tax during the owner's lifetime, deferring indefinitely capital gains taxes that would otherwise be payable at death. In addition to the advantages just enumerated, CCPC owners can also use deferral to re-time income and arbitrage differences in tax rates over time and through the life cycle.

Mindful of these tax planning opportunities, the federal government enacted in 2018 certain changes to the rules just described. Notably, the tax on split income was expanded to apply to more types of payments to family members, including dividends paid to adult family members, except where the shareholder is "actively engaged" in the business. Additionally, the new rules reduce the small business deduction for corporations with more than 50,000 dollars in annual passive investment income and implement other changes intended to reduce incentives for tax-preferred saving through corporations. Finally, the government had proposed new rules to limit surplus stripping from corporations but, after strenuous objections from tax professionals, these proposals were ultimately withdrawn. In all, this review of tax rules suggests that considerable advantages remain for CCPC owners relative to the taxes they would pay if their income were classified as unincorporated business income and subject to tax on a flow-through basis at personal tax rates. The reforms to professional corporation rules permitting share ownership by family members that we study in this paper create clear tax advantages through income sprinkling and surplus stripping. In some cases, they may also have permitted professionals to multiply their access to the lifetime capital gains exemption, with each shareholding family member claiming the exemption in respect of gains on their own shares in the case of arm's-length sales of the business.[9]

[9]Professionals and their tax advisers perceive significant value in the deferral of taxes through professional corporations. In a 2024 policy brief, for example, the Canadian Medical Association (a professional advocacy group) wrote: "It is widely known that the use of a corporation can provide a tax deferral for individual shareholders where funds are left in the corporation instead of being fully extracted as dividends or salary. Much has been said about the supposed 'advantage' that medical professionals have, as more money can

3 Model

This section presents our conceptual framework that describes how a policy inducing incorporation may affect the reallocation of income from a personal side to a corporate form, and subsequently may affect the overall taxable income and tax burdens of a business owner. Then we use our model to describe which behavioral responses are relevant for evaluating the policy that provides tax incentives for incorporation.

Taxation and the entrepreneurial firm. Consider an owner-manager who supplies labor L_t to produce output $F_t(L_t)$ and consumes X_t in each period of life $t = 1, \ldots, H$. Income that is not immediately consumed may be saved inside the business entity and accrues interest at a fixed rate r.

The firm may be organized as either a passthrough entity ($i = P$) or a corporate entity ($i = C$). Income may be subject to taxation when it is earned, when it is consumed, or both, and tax rates depend on organizational form $i = P, C$. We will assume for the moment that tax rates are constant over time but we will relax it later. Let τ_c^i denote the rate paid on current business income F_t, τ_d^i the tax rate on distributions from the business to the shareholder for consumption, and τ_f^i on financial income inside the business entity. To be succinct in notation, we assume that all saving occurs inside the business.[10] The transition equation for financial wealth is

$$X_t = (1 - \tau_d^i)(1 - \tau_c^i)F_t(L_t) + (1 - \tau_d^i)[(1 + (1 - \tau_f^i)r)A_{t-1} - A_t] \qquad t = 1, \ldots, H \qquad (2)$$

We assume that the business begins and ends operations with no financial assets;[11] accumulating (2) at the after-tax interest rate $1 + (1 - \tau_f)r$ and applying the terminal conditions

accumulate in a corporation for investment purposes because of the lower rates of corporate tax. However, ... professional corporations play a significant role in providing a physician with the security they require to save for their retirement." (Canadian Medical Association, 2024).

[10] In the corporate form, it will be the case if distribution tax rate is constant over time, and the tax rate on interest income inside the business does not exceed that applying to saving on personal account. In the pass-through form with no distribution taxes, saving in a business is equivalent to saving in a personal account.

[11] In particular, this is not a limiting assumption even in the presence of the bequest motive in the Canadian context because inheritance may be interpreted as the final period consumption and deemed realization rules imply taxation of accumulated retained earnings at the distribution rate, so that the tax treatment of effective inheritance is the same as the tax treatment of consumption in any other period.

$A_0 = A_H = 0$ yields the lifetime present-value budget constraint

$$\sum_{t=1}^{H} R_t^i \left[(1 - \tau_e^i) F_t(L_t) - X_t \right] \geq 0 \tag{3}$$

where

$$1 - \tau_e^i = (1 - \tau_d^i)(1 - \tau_c^i)$$

is the take-home share of current business income, after deducting business-level taxes and distribution taxes, and

$$R_t^i = (1 + (1 - \tau_f^i) r)^{-t} \tag{4}$$

is the present-value price of period-t consumption at the after-tax interest rate. (Likewise, let $R_t^0 = (1 + r)^{-t}$ denote the corresponding pre-tax price of consumption.)

Corporate and passthrough businesses. For a corporate firm, business income is subject to tax at the corporate rate τ_c, passive financial income at rate τ_f, and distributions from the corporation to the shareholders in the form of dividends or capital gains are taxed again at rate τ_d. For a passthrough entity, the business's full operating cash flow and the return to saving on personal account are both subject to tax at the shareholder's personal tax rate τ_p. For a passthrough firm, we therefore have

$$\tau_c^P = \tau_f^P = \tau_p \quad \tau_d^P = 0 \implies \tau_e^P = \tau_p$$

As discussed in Section 2, the Canadian tax system exhibits a small business corporate tax rate substantially below top personal marginal tax rates $\tau_c \ll \tau_p$. Corporate and personal taxes are partially integrated through a dividend gross-up-and-credit system that approximately equalizes the effective corporate-plus-personal taxes on corporate dividends with the shareholder's personal tax rate. However, capital gains income is underintegrated, so that $\tau_e^C < \tau_p$ for income that is earned as capital gains on corporate shares. Moreover, passive financial income earned in corporations was subject to a complex tax system with implied $\tau_f^C < \tau_p$ for most taxpayers.

These inequalities imply that the rate of return to saving is higher in the corporate form. This has implications for the age profile of consumption and labor supply, which we discuss next.

Life cycle variation in tax rates. In practice, personal income and distribution taxes may vary over time. For example, the tax rate on personal income may be different in retirement than right now. We denote time dependence of a tax rate imposed at time t on base z under business form i as $\tau^i_{z,t}$.

The budget constraint is now

$$\frac{X_t}{1-\tau^i_{d,t}} = (1-\tau^i_{c,t})F_t(L_t) + (1+(1-\tau^i_{f,t})r)A_{t-1} - A_t \qquad t = 1,\ldots,H \tag{5}$$

and, using the same assumptions as before (and having R^i_t incorporate time-dependence of tax rates on financial income), it yields

$$\sum_{t=1}^{H} R^i_t \left[(1-\tau^i_{c,t})F_t(L_t) - \frac{X_t}{1-\tau^i_{d,t}}\right] \geq 0 \tag{6}$$

There are two observations that are important to make at this point. First, the relative price of consumption in periods m and j is no longer $\frac{R^i_m}{R^i_j}$, but rather $\frac{R^i_m}{R^i_j}\cdot\frac{1-\tau^i_{d,j}}{1-\tau^i_{d,m}}$: variation in the distribution tax rate further distorts consumption incentives. Analogously, labor supply incentives are additionally distorted if the profit tax rate varies over time, $\frac{1-\tau^i_{c,j}}{1-\tau^i_{c,m}}$.[12]

Second, the corporate integration system now implies that the effective tax rate on corporate profits varies over time, in particular with the timing of distributions.

Life cycle savings and labor supply. Under ownership structure $i = C, P$, the entrepreneur chooses $\{(X_t, L_t)\}$ to solve

$$V^i = V(\tau^i_e, \tau^i_f) = \max \sum \delta^t U_t(X_t, L_t) \quad \text{subject to (3)–(4).} \tag{7}$$

The first-order conditions for (7) imply that consumption choices satisfy the Euler equation

$$\delta(1+(1-\tau^i_f)r)U_{Xt} = U_{Xt-1} \tag{8}$$

Labor supply is chosen in each period to equate the marginal rate of substitution within period to the marginal product of labor, net of all taxes $\tau^i_e = \tau^i_c + (1-\tau^i_c)\tau^i_d$:

$$-\frac{U_{Lt}}{U_{Xt}} = (1-\tau^i_e)F_{Lt} \tag{9}$$

[12] In particular, if $\tau^i_{c,j}$ does not vary over time, the only distortion to the intertemporal margin of labor supply is due to taxation of financial income.

A reduction in the taxation of financial income causes saving to rise, as shown in (8). But the entrepreneur can increase saving either by deferring consumption, or by increasing labor supply early in the life cycle. The corporation is like a tax deferred account, but contributions to the account are achieved by working and generating corporate earnings to be saved. This can be seen most directly in the special case in which within-period utility is of the additive iso-elastic form

$$U_t(X_t, L_t) = \frac{X_t^{1+\eta}}{1+\eta} - \frac{L_t^{1+\gamma}}{1+\gamma} \tag{10}$$

In this case, the life-cycle path of consumption satisfies the familiar condition

$$\delta[1 + (1 - \tau_f)r]X_t^{\eta} = X_{t-1}^{\eta} \tag{11}$$

so that $1/\eta$ is the intertemporal elasticity of substitution. If the production function is linear, $F_t(L_t) = w_t L_t$, we may substitute (11) into (9) to obtain a closed-form expression for the life-cycle path of labor supply:

$$\log \frac{L_t}{L_{t-1}} = \frac{1}{\gamma}\left[\log \frac{w_t}{w_{t-1}} - \log \delta - \log(1 + (1 - \tau_f)r)\right] \tag{12}$$

In the iso-elastic model, labor grows proportionally with growth in productivity of labor. As shown in (12), $1/\gamma$ is the Frisch elasticity of substitution between labor at each date.

The effect of a decrease in the tax rate on financial income can be obtained by differentiating (12) to obtain

$$\frac{\partial \log(L_t/L_{t-1})}{\partial \tau_f} = \frac{1}{\gamma}\frac{r}{1 + (1 - \tau_f)r}$$

A decrease in τ_f therefore causes the age-earnings profile to decline more steeply over time. Faced with a higher after-tax return to saving inside the corporation, the entrepreneur responds by increasing labor supply early in life, relative to labor at later dates. The effect of τ_f on the age-earnings profile is proportional to the Frisch elasticity $1/\gamma$.

Our model does not incorporate a retirement decision, instead assuming that optimal labor supply is interior at each date. This is both for simplicity and because 12 years of data that we have post-reform is not enough to observe retirement except for the oldest doctors who are also least affected due to their short horizon for accumulating retained earnings. A simple extension of this model would add a fixed cost of working in each period; retirement (or zero labor supply) would then occur when the marginal rate of substitution in (9) at zero labor supply exceeded the after-tax wage. In this extension, the model would also imply

that a decrease in the tax on financial income would lead to earlier retirement, due to the wealth effect.

Welfare analysis. Is a shift from passthrough to corporate taxation socially desirable? The answer depends on the effects of incorporation on the taxpayer and on tax revenues. In this model, an exogenous shift of an entrepreneur from passthrough to corporate organization is equivalent to the vector of tax changes

$$(\Delta\tau_e, \Delta\tau_f) = (\tau_e - \tau_p, \tau_f - \tau_p)$$

If $(\Delta\tau_e, \Delta\tau_f) < 0$, effective tax rates on active and passive business income fall with incorporation. Such changes lead to mechanical revenue losses and a transfer to the entrepreneur from the treasury. But the behavioral changes in labor and savings may offset the mechanical effects, reducing revenue loss. We can evaluate the resulting equity–efficiency tradeoff in a dynamic sufficient statistics framework.

Using the budget constraint (3), we write tax revenue in each organizational form as a function

$$T^i = T(\tau_e^i, \tau_f^i) = \tau_e^i \sum R_t^0 F_t - \sum (R_t^i - R_t^0) N_t \tag{13}$$

where

$$N_t = (1 - \tau_e) F_t - X_t \tag{14}$$

are net additions to retained earnings in the current period. This expression shows that the tax system $(\tau_c^i, \tau_d^i, \tau_f^i)$ is equivalent to a tax on business income F_t as it accrues at rate τ_e^i, together with a tax or subsidy to net earnings deferred within the business N_t at effective rate $R_t^i - R_t^0$. All net earnings are eventually paid out, so that it is a subsidy when the business retains earnings, $N_t > 0$, and a source of revenue when earnings are distributed, $N_t < 0$.

The gain from incorporation to the taxpayer can be approximated using (7) as

$$V^C - V^P \approx \frac{\partial V}{\partial \tau_e}(\tau_e - \tau_p) + \frac{\partial V}{\partial \tau_f}(\tau_f - \tau_p) > 0$$

where the marginal mechanical effects are

$$\begin{aligned} \frac{\partial V}{\partial \tau_e} &= \lambda \sum R_t F_t \\ \frac{\partial V}{\partial \tau_f} &= \frac{\lambda r}{1 + (1 - \tau_f) r} \sum t R_t N_t \end{aligned} \tag{15}$$

and λ is the marginal utility of income. These first-order gains to the entrepreneur from incorporation are offset by corresponding mechanical losses in tax revenue,

$$M = -\frac{V^C - V^P}{\lambda}$$

In addition, the switch to corporate form has behavioral effects on revenue, due to the changes in the life-cycle path of consumption and labor supply discussed above. We may approximate the behavioral effect on revenues by differentiating (13) at $\tau_e, \tau_f = \tau_p$ to obtain

$$B = \tau_p \sum R_t^0 \Delta F_t - \sum (R_t^P - R_t^0) \Delta N_t \tag{16}$$

We can evaluate the welfare effects of the shift to incorporation by calculating the marginal value of public funds (Hendren and Sprung-Keyser, 2020*b*). The social value of the mechanical transfer to the entrepreneur is $-(1-g)M$, where g is the marginal social value of a \$1 lump-sum transfer from tax revenues. The social benefit of the switch to incorporation per dollar of revenue lost is therefore

$$\text{MVPF} = \frac{(1-g)M}{\Delta T} = (1-g)\frac{M}{M+B} \tag{17}$$

In summary, we can estimate the mechanical and behavioral impacts on revenue from an exogenous switch from pass-through to corporate organization. The behavioral effect can be approximated by the long-run change in combined (corporate and personal) income of the physician, multiplied by the tax rate that would have applied to the passthrough entity, plus the corresponding change in taxes paid on income deferred through the corporate form. The size of the behavioral gain in revenues, relative to the mechanical loss in revenues, is a sufficient statistic for the impact of the change on social welfare.

4 Data and Outcome Variables

For our empirical analyses, we use the following datasets all merged at the individual level using the unique identifier: (1) individual tax returns data (T1PMF) to identify individual income and tax information, (2) family data file (T1FF) to identify family-level income and tax information, (3) ownership data on incorporated businesses (T2S50), (4) firm-level balance sheet data (NALMF) to identify corporate income and tax information, and (5) ownership data on unincorporated businesses. We link these datasets at the individual level so that we have comprehensive information on the person's various income sources, taxes,

ownership rates of incorporated and/or unincorporated businesses and their balance sheets. If the person is married, we also construct the combined income and tax information that accounts for the spouse and children.

All of these data are from 2001 to 2017, except for the ownership data on unincorporated businesses, which start in 2005. The relevant analysis sample consists of all individuals who ever own any incorporated or unincorporated business starting from 2005 (given that our data on unincorporated businesses start from 2005). We make this sample restriction to identify and focus on high-income professionals (e.g., doctors) since we do not observe the individual's occupation, but instead only observe the industry code for each business – e.g., an individual who has ownership in a clinic (NAICS 6211, offices of physicians) must be a doctor in Ontario prior to the 2006 reform, and is still most likely to be a doctor, rather than a nurse or health care staff, even after the reform. From the family files, we can differentiate a doctor from her family members among all owners in a medical business.

The main limitation due to the unincorporated data starting from 2005 is that we cannot test for parallel pre-trends for outcomes related to businesses alone, such as employment, capital investment, and total revenue. For example, to examine what happens to capital investment or employment after incorporation, we need to be able to follow the investment and the number of workers before and after a business is incorporated. Because the unincorporated business data starts from 2005, we cannot test whether the trends were parallel relative to the control group before 2005. But for all the other key outcome variables at the individual level, such as their taxable income and tax burdens, we can follow from 2001.

The main outcome variables are various measures of individual- and family-level income, such as their taxable income, capital income (e.g., dividends), and labor income. We also look at taxes paid on their income (combining federal and provincial levels). To assess whether there is any income shifting from the personal side to the corporate one after incorporation, we directly examine the key outcomes at the firm level, such as pre-tax deferred corporate income (defined as changes in retained earnings plus corporate taxes) and corporate taxes paid (federal and provincial taxes combined). For individuals who incorporate their businesses only after the reform, these variables would be mechanically zero prior to the reform. Any subsequent changes in these outcomes reflect both the reallocation of income (from personal side to corporate side) and changes in businesses activities (i.e., firm expansion after incorporation). Therefore, we also examine overall taxable income and taxes paid, combining pre-tax personal income and taxes with pre-tax corporate income and taxes paid. Note that the overall taxable income would remain the same after incorporation if there is no change in real business activities. However, the combined taxes paid may decrease after incorpora-

tion through reallocation of income given that the marginal tax rate on corporate income is lower than the marginal tax rate on personal income. On the other hand, if there are large increases in business activities through firm expansions after incorporation, corporate income may increase significantly, which may lead to increases in corporate income. We look at changes in average effective tax rates, defined as total taxed paid divided by total income. To check whether there is any change in real business activities, we look at changes in the number of workers, capital investment, and revenue. Additionally, we observe a spousal hire in the firm.

5 Empirical strategy

We use a triple-difference design to estimate the impact of decisions to incorporate on the business activities of small firms, and on the incomes received and taxes paid by business owners. The decision to incorporate reflects multiple factors, creating challenges in identifying the causal impact of incorporation events. To provide causal evidence, we focus on incorporation by Canadian physicians. In particular, we exploit the 2006 reform in Ontario which allowed physicians' family members to own shares in these businesses, creating opportunities for "income sprinkling" to family members and other forms of tax avoidance via the corporate form.

To assess the effects of this reform on the key outcomes, we first compare the outcomes of doctors in the treated province (Ontario) with the outcomes of doctors in other provinces (e.g., British Columbia and Saskatchewan) before and after the policy change. The intuition is that doctors across different provinces are similar in terms of their income level, but their incentives to incorporate their businesses were unaffected by the reform. To absorb any province-specific or other policy changes, we make the same difference-in-differences comparisons using business owners in similar professions (e.g., other health care professionals, lawyers, and accountants). Our triple difference design would absorb any province-specific shocks or industry-specific shocks that may have coincided with the policy. The key identifying assumption behind our empirical design is that affected and unaffected groups' outcomes would have trended similarly in the absence of the reform. As a robustness check, we show a separate difference-in-differences results where we compare doctors in Ontario with doctors in other unaffected provinces before and after the reform in Ontario.

To validate our empirical design and visualize the reform's effects on the key outcomes,

we estimate the following model:

$$Y_{it} = \theta_t \cdot Doctor_i \cdot ON_i + \gamma_t \cdot Doctor_i + \lambda_t \cdot ON_i + \alpha_i + \phi_t + u_{it}, \tag{18}$$

where Y_{it} is the outcome of individual i in year t, $Doctor_i$ is an indicator equal to one if the individual is a physician or dentist, ON_i is an indicator equal to one if the individual is in Ontario, α_i are family fixed effects, and ϕ_t are year fixed effects. Each coefficient θ_t measures the change in Y_{it} for treated relative to control individuals in year t, with θ_{2005} is normalized to zero. Standard errors are clustered at the family level.

To ensure that the control group (in other industries/occupations) is comparable to physicians, we first find 2-digit sectors of business owners that had a similar pre-reform incorporation rate prior to the reform compared to that of physicians in Ontario. Then among business owners within these industries as well as physicians in other provinces, we match them based on their experience bins, gender, marital status, and family size measured in 2005.[13] Table 1 shows that while the overall income and tax burdens of doctors in Ontario are larger compared to those of doctors in other provinces, the difference is comparable to that of other high-income professionals between Ontario and other provinces. Thus, underlying differences in pre-reform characteristics such as their overall income or taxes would be absorbed in the triple-difference framework. Furthermore, the demographics of physicians in Ontario, such as their average age, share of males, marital status, and family size, are also comparable across provinces and other high-income professionals.

To study the life-cycle impacts of incorporation in more detail, we exploit heterogeneous responses across different birth cohorts (defined as doctors in their 30s, 40s, ..., in 2005) because the incentives to incorporate and behavioral responses to incorporation may differ significantly across their life cycle. For example, we would expect younger physicians to expand their businesses much more upon incorporation and experience a larger increase in their overall taxable income compared to older physicians.

6 Results

To evaluate the impacts of the reform, we first examine the share of incorporated businesses. We compare the incorporation rates of doctors in Ontario relative to those of doctors in

[13] A business owner's experience is defined as the difference between the age of the owner in a given year minus the median graduation age of a given 4-digit industry. The graduation age is computed by aggregating individual information on the last year in which a person claims tuition credits for a subset of people who claim these.

other provinces before and after the reform. We then compare these differences to the same differences among other high-income professionals. As Figure 1 shows, we find a large and significant increase in incorporation rates for physicians in Ontario after the reform. Column (1) of Table 2 shows that the incorporation rate increases by 11.2 percentage points (from a mean of 17.7 percent), meaning that it almost doubles after the reform. There is also some evidence of tax planning sophistication on the part of these taxpayers. The number of corporate businesses rises more sharply than the proportion of doctors who have a corporation, indicating that some doctors incorporate multiple entities over time. The proportion with financial and other non-medical corporations also rises. All this is suggestive of the role of incorporation in creating holding company structures that facilitate the reinvestment of earnings and may also play a role in tax planning. Note that this estimate is based on comparing doctors in Ontario relative to doctors in other provinces, and comparing the same differences among other high-income professionals between Ontario and other provinces. For simplicity, we describe our triple-difference estimates as the outcomes for doctors in Ontario relative to those of the control group after the reform.

Next, we assess how pre-tax individual income and taxes change after the reform. As Figure 2, Table 2, and Table 3 show, the personal income of doctors and family-level personal income (including the spouse's income when married) in Ontario decrease by 8,430 dollars and 8,995 dollars on average, respectively, relative to the control group after the reform. By contrast, deferred corporate income at the family level increase by 19,753 dollars on average after the reform. These results suggest a significant reallocation of family-level income from the personal side to the business side.

In particular, as Figure 3 and Table 3 show, the doctor's employment income decreases sharply and almost immediately, by 12,462 dollars on average, while dividend income rises by 1,439 dollars (but not enough to offset the fall in labor income). By contrast, the spouse's employment income decreases by 3,769 dollars with modest changes in dividend income, respectively, on average, providing evidence of income splitting between physicians and their spouses (who face a lower tax rate) after the reform. Subsequently, as Figure 4 and Table 2 show, personal taxes paid (federal and provincial combined) decrease by 8,475 dollars on average. By contrast, corporate income taxes paid (combining federal and provincial) increase by 6,997 dollars on average. These findings suggest that the reform not only provided strong incentives for physicians in Ontario to incorporate their businesses, but also to shift and retain part of their income in the lower-taxed organizational form.

Assessing overall taxable income and taxes paid (combining both personal and corporate components), however, shows that these results reflect more than pure reallocation and tax-

saving behavior. We find that combined taxable income rises in the medium run, followed by a decline in the long run after the reform. Consequently, overall tax burdens rise in the medium run and fall in the long run, leading to a reduction in average effective tax rates. Table 2 shows that overall taxable income increases by 7,514 dollars, while overall taxes paid and average effective tax rates decrease by about 1,198 dollars and 0.4 percentage points (a 2 percent reduction), respectively, on average after the reform.

While incomes and taxes fall over time, doctors retain a significant deferred-tax asset in their corporate retained earnings. Figure 5 shows the estimated effect on retained earnings in corporations. These amounts are recorded on a pre-tax basis. An important question for future research is how these funds are ultimately distributed from the firm and the effective tax rate that is paid.

While incorporation appears to play an important role in tax planning, there are real effects as well. We find that the number of workers, capital investment, and firm revenue increase for the treated group after the reform, providing evidence of firm expansion (Figure 6). These results suggest that post-reform increases in firms' retained earnings reflect not only reallocation effects, but also increased business activities and intertemporal substitution of labor following incorporation.

7 Heterogeneity Analyses and Policy Implications

Our results so far suggest that the policy that provided tax incentives for incorporation led to significant rises in incorporation rates by doctors in Ontario relative to their control group, which subsequently led to increases in their overall income and slight reductions in overall taxes and average effective tax rates. These changes are driven by both reallocation of income from the personal side to the corporation as well as by the expansion of real business activities.

These average effects might mask important heterogeneity across demographics (e.g., experience/age groups and gender) and by occupations. First, younger doctors who incorporate early in their life have more time to save and grow their income inside the corporation compared to older doctors. As discussed in our model (Section 3), we expect that the policy would have larger impacts on their overall income through higher deferred corporate income (i.e., retained earnings) and expansion of business activities through the intertemporal substitution of labor because benefits from deferral of retained earnings grow with the planning horizon. Second, characteristics of family may matter for benefiting from income sprinkling,

because in the Canadian system of individual taxation potential benefits are due to shifting income to a lower income spouse. To the extent that spouses of female doctors have higher incomes on average, we might expect that female doctors are less likely to engage in "income sprinkling" with their spouse upon incorporation after the policy relative to male doctors.

Finally, while both physicians and dentists are affected by the same reform, dentists may respond differently relative to physicians because their businesses in the Canadian context are likely to more capital intensive and because their fees are not regulated by the government. While this difference in the fee system may allow dentists to work more hours after incorporation, it is also possible that dentists already maxed out their working hours before the policy, and they can make little adjustments to their labor supply compared to physicians after incorporation to generate more income.

7.1 Gender

Figure 7 and Table 5 show the triple-difference results separately for men and women. While the effects on incorporation rates are higher for males, female doctors show higher increases in their overall income. Furthermore, male doctors show larger decreases in total taxes and average effective tax rates compared to females. Overall, while there are some differences between males and females, they are not very large and possibly explained by different family characteristics that may affect planning strategies involving income sprinkling.

7.2 Physicians versus Dentists

Figure 8 and Table 6 show the triple-difference results separately by physicians and dentists. We find that the results for dentists are noisier but qualitatively similar to those for physicians. In particular, this alleviates the concern that the effects we estimate might be confounded by the single-payer aspect of the Canadian system. However, Figure 8 shows that there are notable differences in retained earnings and capital investment. While physicians have higher increases in retained earnings, dentists spend more on buying medical equipment or machine to invest their profits back to their businesses. Anecdotally, Canadian dentists are much likely to own their equipment in general or, put differently, their businesses are more capital-intensive. Thus, these findings suggests that the effect of incorporation on the investment channel may be of more importance for other classes of businesses than our results for doctors indicate.

7.3 Age/Experience Cohorts

There are significant differences across graduation cohorts in incorporation effects and income-related outcomes. This is indicative of heterogeneous life-cycle patterns in the adoption of the corporate form and in how corporations are used in business decisions. Figure 9 and Table 7 show heterogeneous impacts on incorporation and total income. Increases in incorporate rates are similar across experience cohorts. However, we see substantial heterogeneity in overall income, total taxes paid, and retained earnings between the youngest cohort and oldest cohort. We find that younger cohorts experience larger increases in overall income, taxed paid, and retained earnings relative to older cohorts as the younger doctors have more incentives to work more earlier in their life to take advantage of higher returns on saving inside the firm. Furthermore, younger doctors increase their investment in medical equipment more compared to older doctors. These results are consistent with the predictions of our model.

7.4 Robustness

Broad qualitative similarity of the results across different groups is encouraging evidence supporting our trust in the identification strategy. Figure 10 further probes another aspect of our main approach: the reliance of triple difference strategy. One could consider instead a simpler approach that would compare physicians in Ontario to those in other provinces, without comparing to other industries. The results remain qualitatively unchanged when we use a difference-in-differences design where we compare doctors in Ontario with doctors in other provinces before and after the 2006 reform.

7.5 Welfare Implications

The incorporation reform leads to large increases in doctors' total incomes, alongside a decline in tax revenues. On average, treated doctors' incomes rise about 7,500 dollars per year with the reform, while net tax revenues fall by approximately 1,200 dollars per doctor annually. These patterns are consistent with substantial real behavioral responses to lower effective marginal tax rates on both labor income and savings within the corporate form.

To understand the welfare implications of these results, we decompose the effect on tax revenues into mechanical and behavioral components. Using (16), the behavioral revenue effect is constructed as the treatment effect on total income multiplied by the relevant personal marginal tax rate, capturing the additional tax revenue that would have been collected

in the absence of income shifting into the corporate sector. The mechanical effect is then the residual difference between the observed change in tax revenue and this behavioral component.

Table 8 reports the results for this decomposition across experience groups. For the full sample, we estimate a behavioral revenue effect of approximately 3,500 dollars per doctor, and a mechanical revenue loss of about 4,700 dollars. The resulting MVPF of the reform is 3.9, reflecting large income gains relative to the modest net fiscal cost. This decomposition highlights that most of the fiscal cost arises from income shifting rather than real reductions in taxable income.

There is substantial heterogeneity in results by experience groups. Doctors with 0-9 years of experience exhibit particularly large income responses, generating positive net fiscal effects and hence an effectively infinite MVPF. For doctors with 10-19 years of experience, the estimated fiscal cost of the reform is negligible, and the MVPF approximately 100. For more experienced doctors, the income responses are muted, and the resulting MVPFs much lower. For doctors with 20-29 years and 30-39 years of experience, the estimated revenue losses are 2,200 dollars and 1,800 dollars respectively, and the estimated mechanical effects are also somewhat smaller. As discussed previously, this likely reflects the relatively short horizons of these doctors between the reform and planned retirement, which gives them less opportunity for tax planning through deferral in their corporations. The resulting MVPFs are approximately 1.5 and 2.5 for the highest experience groups, as behavioral responses are smaller relative to the mechanical revenue losses.

While these results indicate sizable efficiency gains from the reform, the ultimate social impact of the reform depends on the welfare weight ascribed to transfers to these high-income individuals. Virtually all treated doctors in our sample are in the top marginal tax bracket of the income tax system, and most are in the top one percent of the distribution of fiscal income. Estimates in Hendren and Sprung-Keyser (2020*b*) indicate that top-bracket tax reductions in the United States have an MVPF of 1.85 or more. The corresponding estimates are likely higher in Canada, where top-bracket marginal tax rates are somewhat higher also. It therefore appears safe to conclude that reforms facilitating incorporation by high-income professionals like doctors are socially desirable.

8 Conclusions

Our findings indicate that Canadian physicians took advantage of the option to incorporate and that their responses reflect the mixture of shifting and real changes. They reallocate personal income to the corporate form and defer income realization by building significant retained earnings stock. At the same time, we also find evidence of real behavioral responses. Most clearly, this is visible in terms of an increase in their combined personal and business income, but there is also evidence of increased business revenue, increased investment and, potentially, employment. The caveat to the effect on employment is that most of it is accounted by employing the spouse. This is potentially reflecting income shifting rather than real response and it is also adding to our other evidence showing that accounting for adjustments within family is important for understanding the full picture of responses. Finally, there is dynamics of these changes: while effects on income materialize quickly they appear to dissipate over time, consistently with our intertemporal labor supply framework which suggests that taking advantage of deferral possibilities should correspond to steepening of lifetime labor supply profile.

These effects are broadly consistent for men and women doctors. They are qualitatively similar but with some important differences for physicians and dentists: the latter group responds much more strongly on the investment margin, consistently with anecdotal evidence that Canadian physicians rely on corporate structures as a substitute for saving while dental clinics have more of a capital intensive business character. Finally, age heterogeneity reveals stronger shifting and behavioral responses for younger individuals who have the most to gain from deferral.

Placing these results in a welfare framework suggests that the effective tax reduction that comes with the corporate structure might be welfare improving due to the strength of behavioral response. This is in particular the case when focusing on younger individuals. Two caveats to this conclusion have to do with the limited horizon of our data: 12 years of follow up is not short but the horizon for firm-based planning is likely to involve the lifetime. First, we are missing these even longer-term behavioral and revenue consequences and in particular we cannot observe the full future tax implications of accumulated retained earnings. To the extent that it leads to additional revenue, this might push in the direction of further reducing the revenue impact, but to the extent that it corresponds to further slowing down later in life (including earlier retirement) it might also generate revenue losses. Second, we are evaluating the impact of a reform not the permanent effect of incorporation. Here, the evidence for younger individuals is likely more informative because it is closer to reflecting

planning for the full lifetime (although even in this case it is missing any anticipation effects earlier in life and, obviously, it is still limited to just 12 years of followup).

Overall, this work indicates that corporate tax treatment for high income professionals may not be a welfare loser. At the same time, it highlights that understanding questions about tax policy and distribution related to (potential) business owners requires integrating individual and business side data, accounting for adjustments within family, and dynamics.

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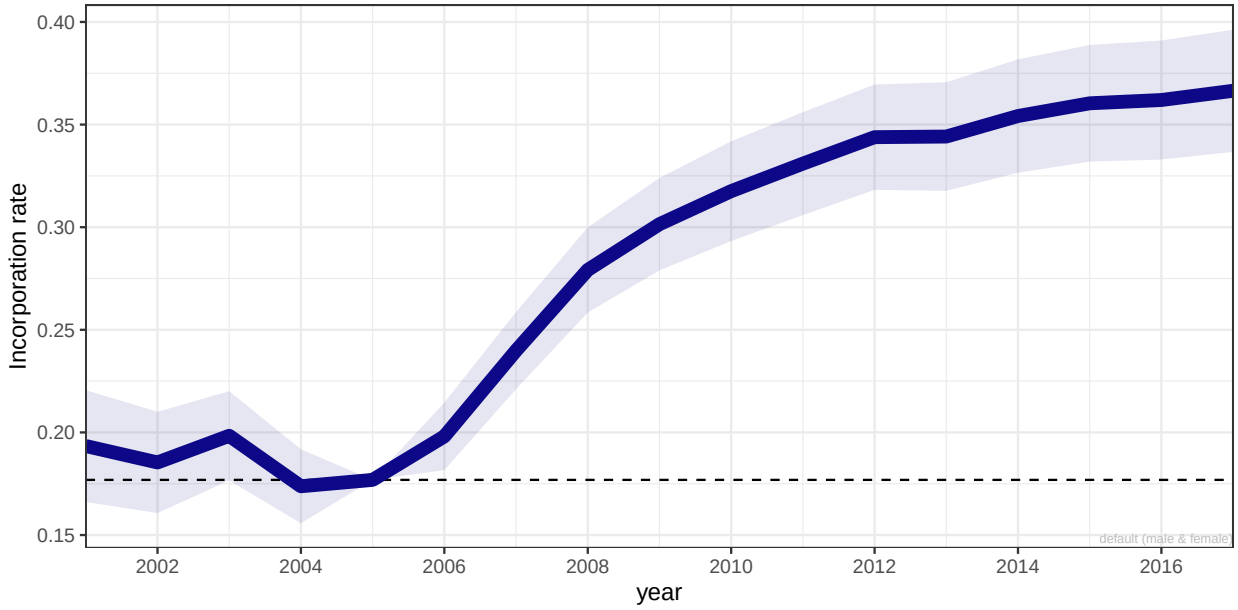
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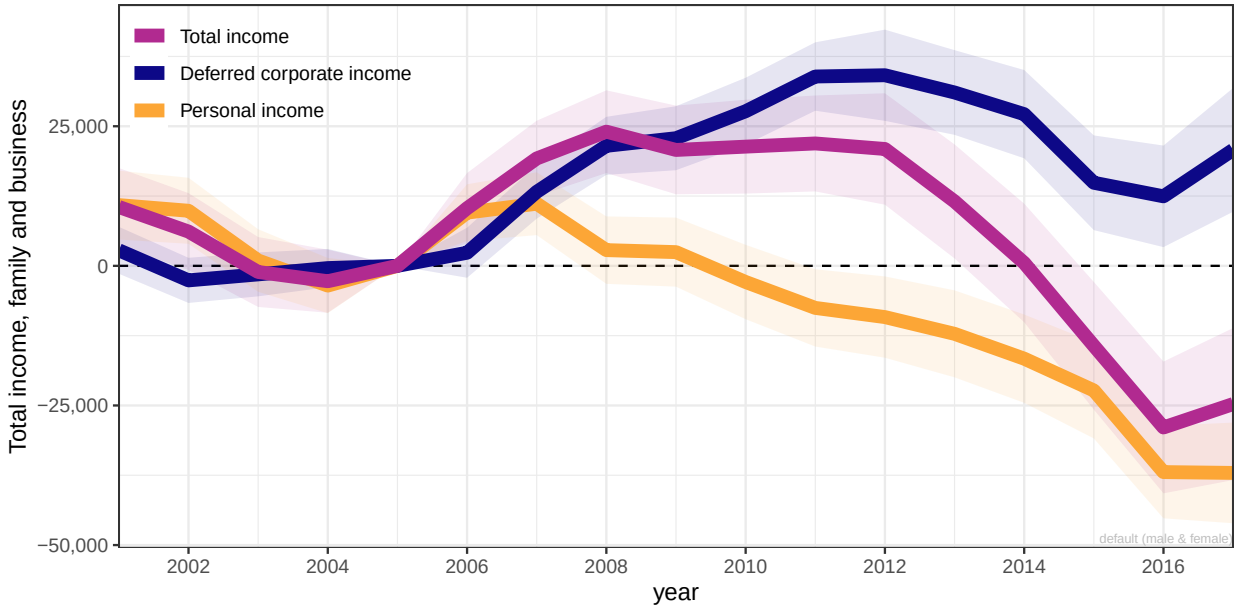
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Figure 1: Reform effects on incorporation



Notes: Estimated treatment effects of the 2006 Ontario reform on various measures of incorporation by doctors. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

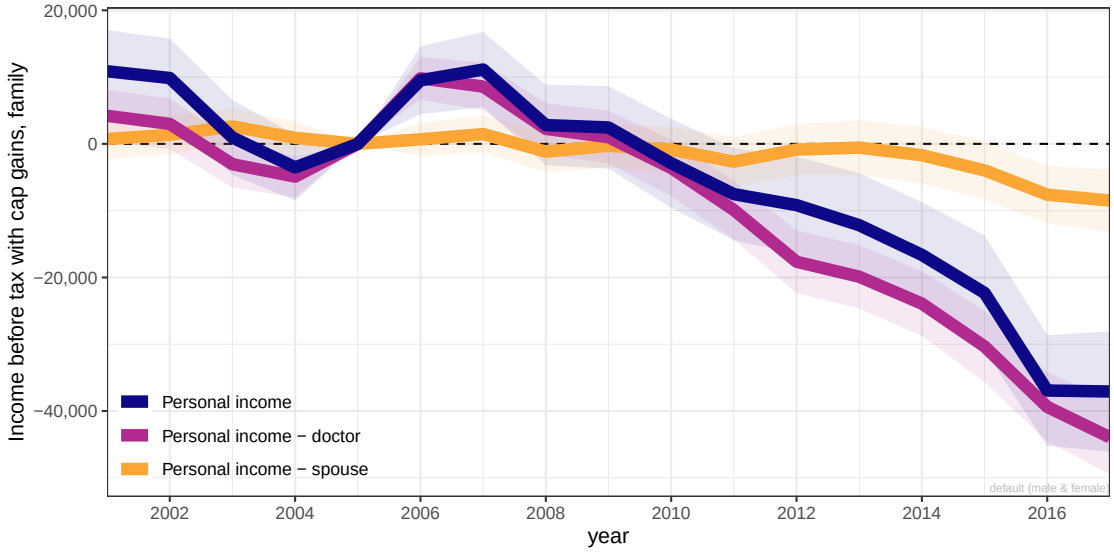
Figure 2: Reform effects on components of income



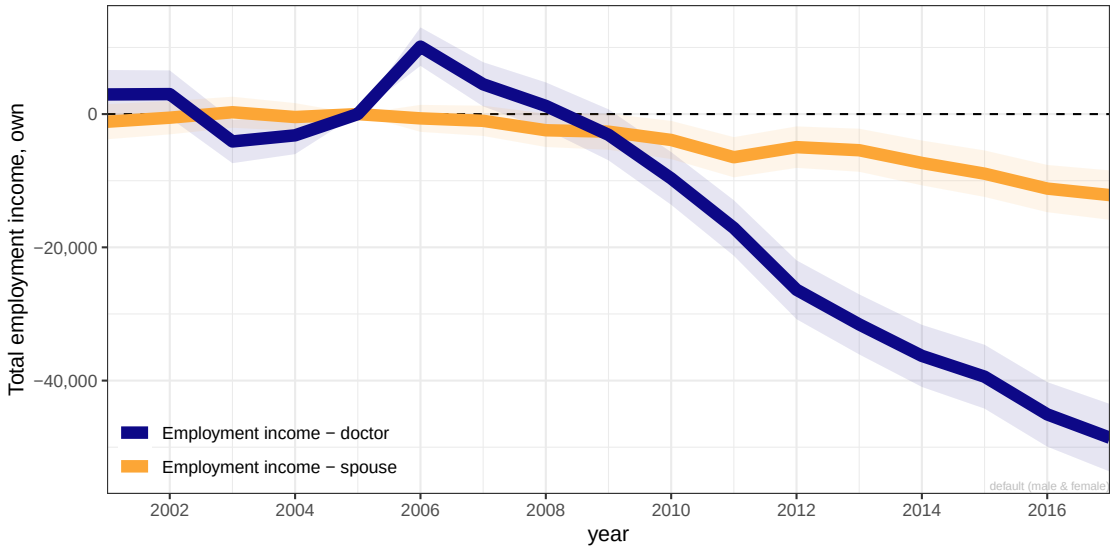
Notes: Estimated treatment effects of the 2006 Ontario reform on total family income and its components. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 3: Income shifting within family

(a) Total personal incomes



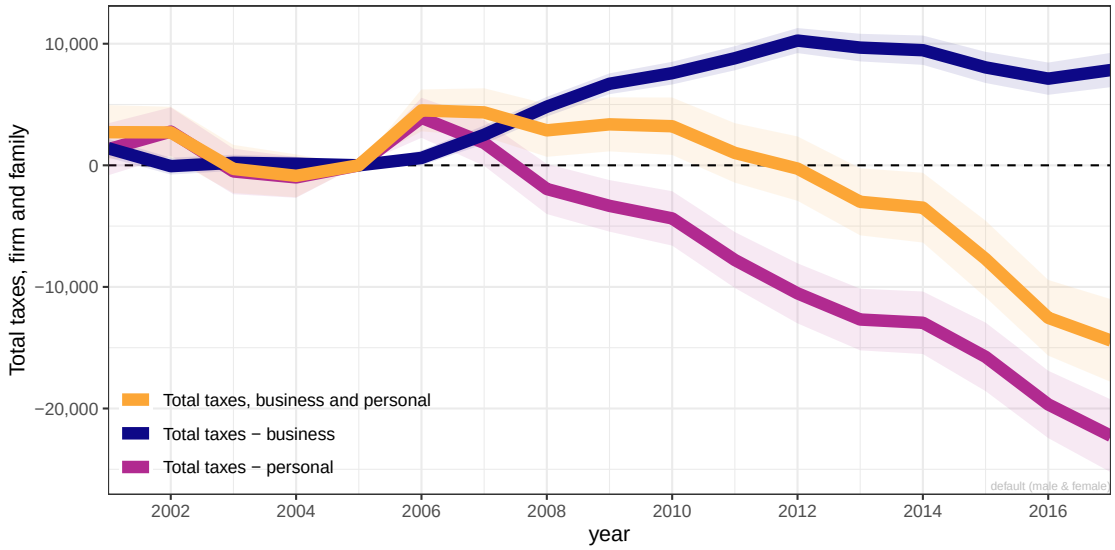
(b) Employment incomes



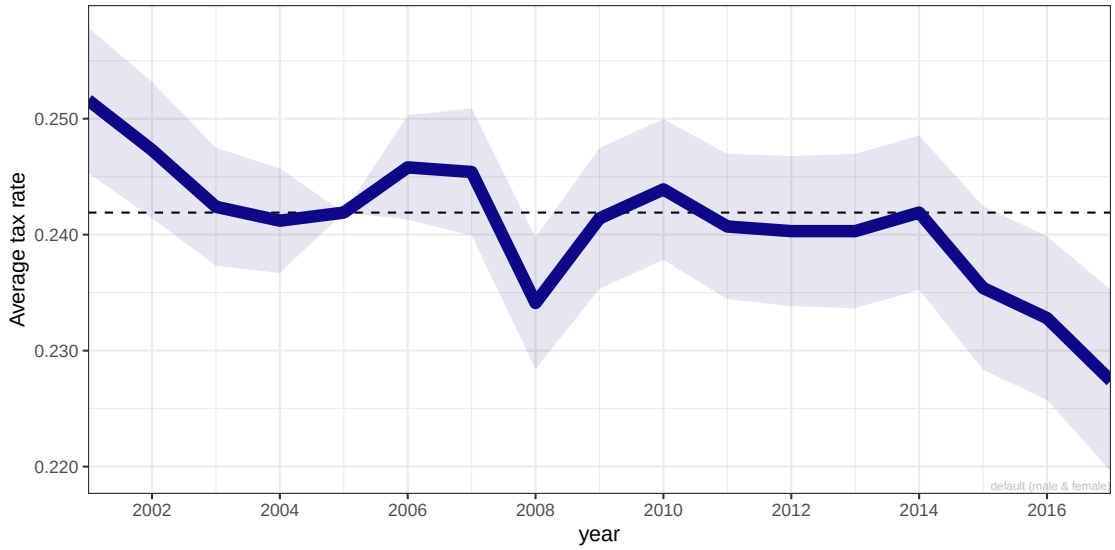
Notes: Estimated treatment effects of the 2006 Ontario reform on components of income for the doctor and spouse. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 4: Reform effects on taxes paid

(a) Total taxes



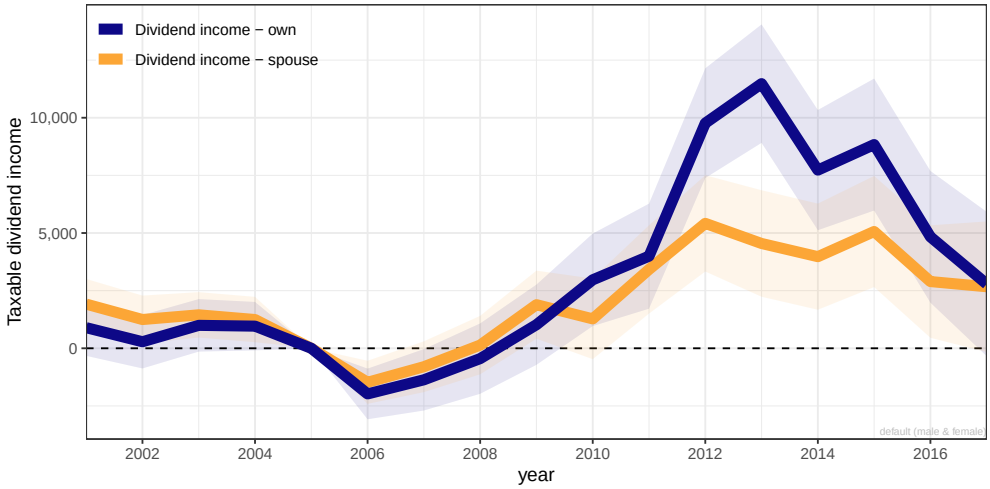
(b) Average tax rate



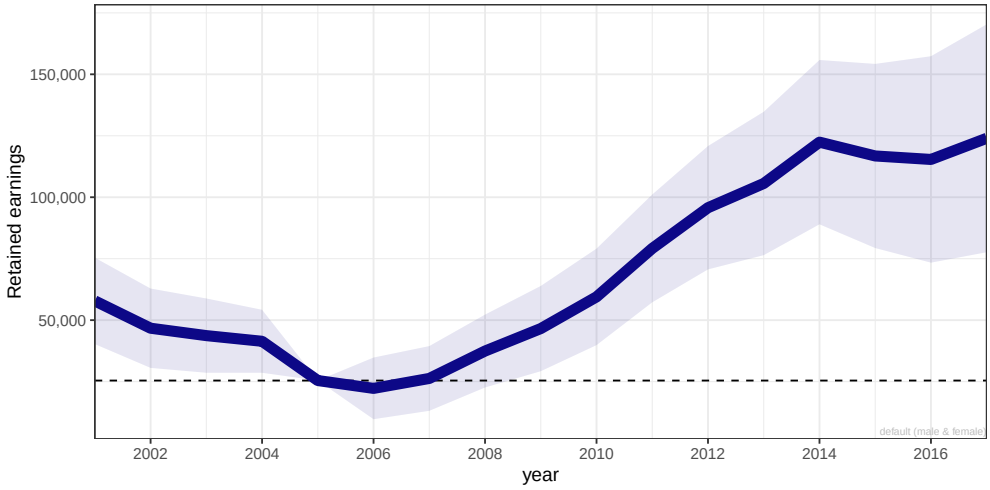
Notes: Estimated treatment effects of the 2006 Ontario reform on personal and corporate taxes paid by the doctor's family. The first panel shows effects on taxes paid in dollars. The second panel shows effects on the family average tax rate. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 5: Corporate distributions and retentions

(a) Dividend incomes



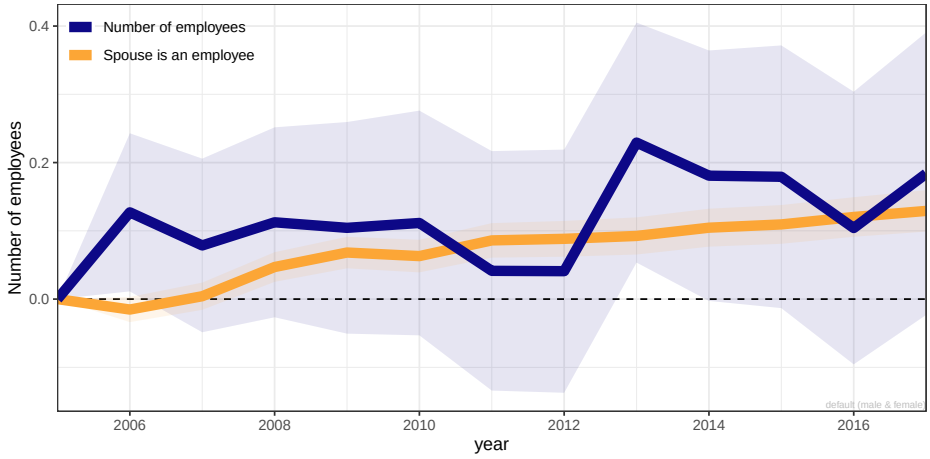
(b) Retained earnings



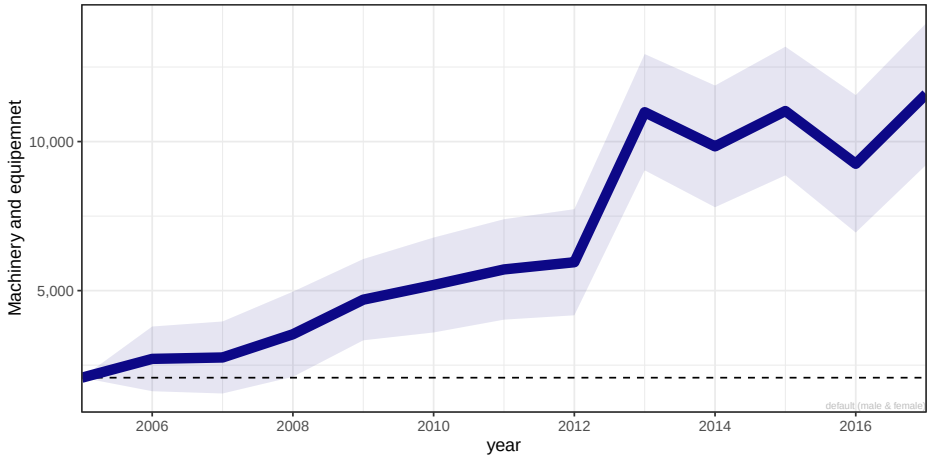
Notes: Estimated treatment effects of the 2006 Ontario reform on dividend income received, retained earnings of the corporation, and capital gains realized. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 6: Firm-level outcomes

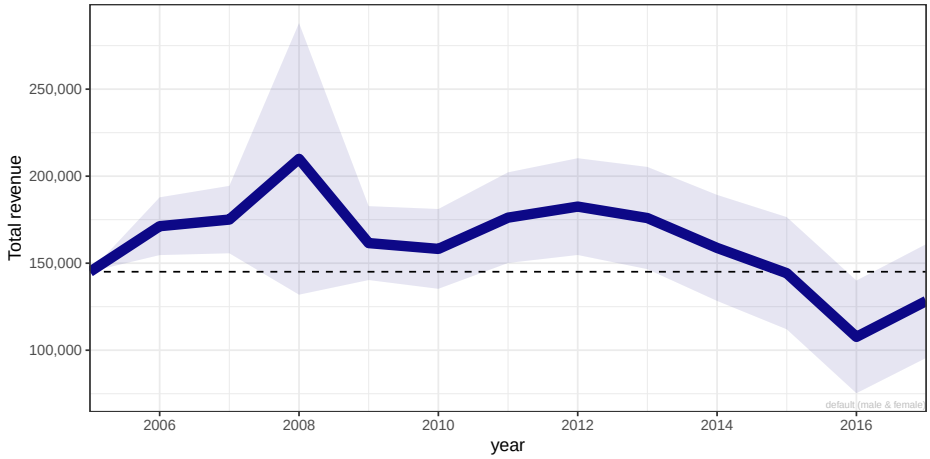
(a) Employment



(b) Machinery and equipment investment



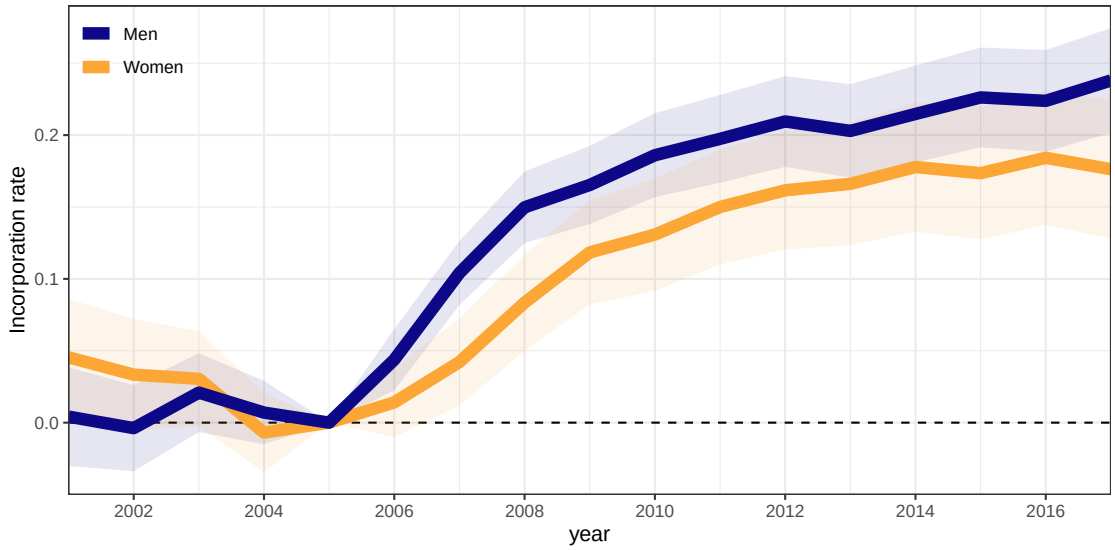
(c) Total revenue



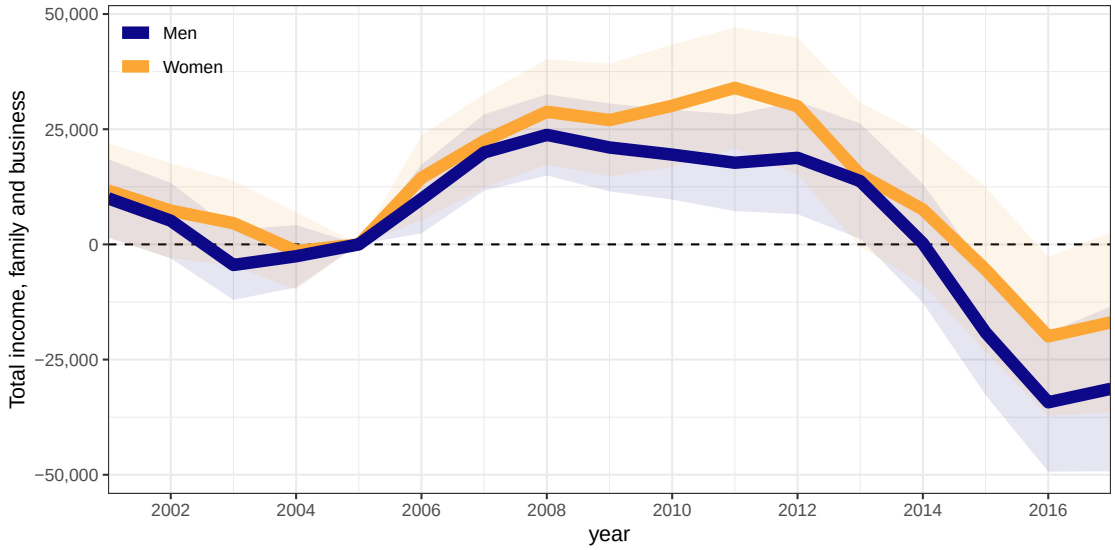
Notes: Estimated treatment effects of the 2006 Ontario reform on measures of firm-level activities. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 7: Comparison of the effects on men and women

(a) Incorporation rate



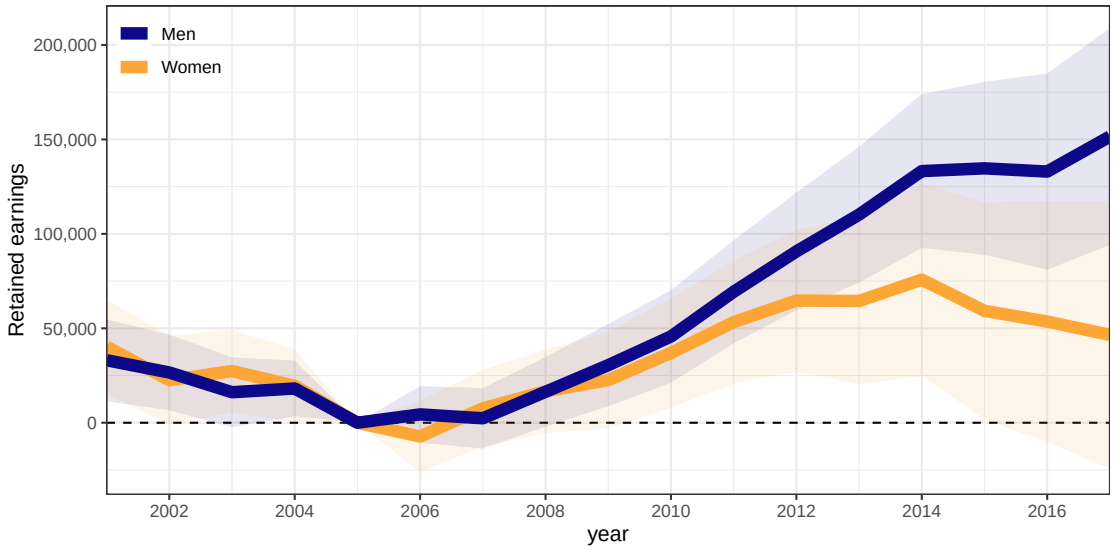
(b) Total income



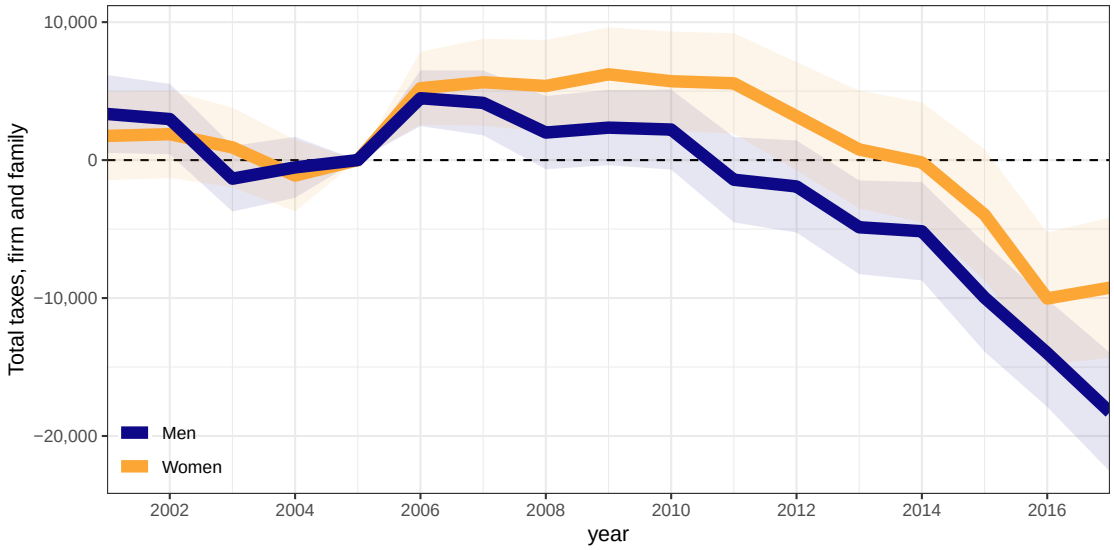
Notes: Estimated treatment effects of the 2006 Ontario reform for male and female doctors separately. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 7: Comparison of the effect on men vs women (continued)

(c) Retained earnings



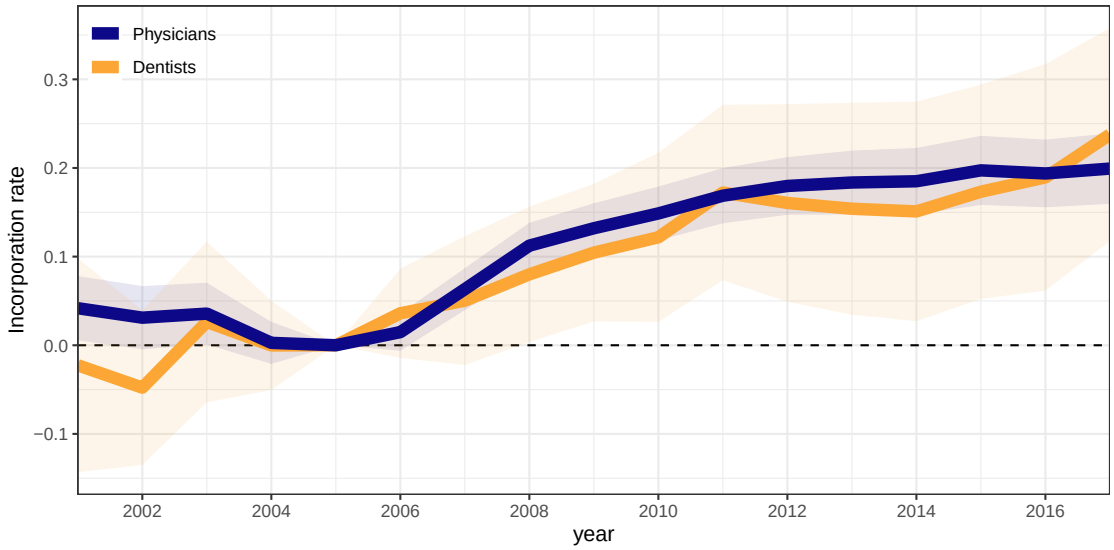
(d) Total taxes



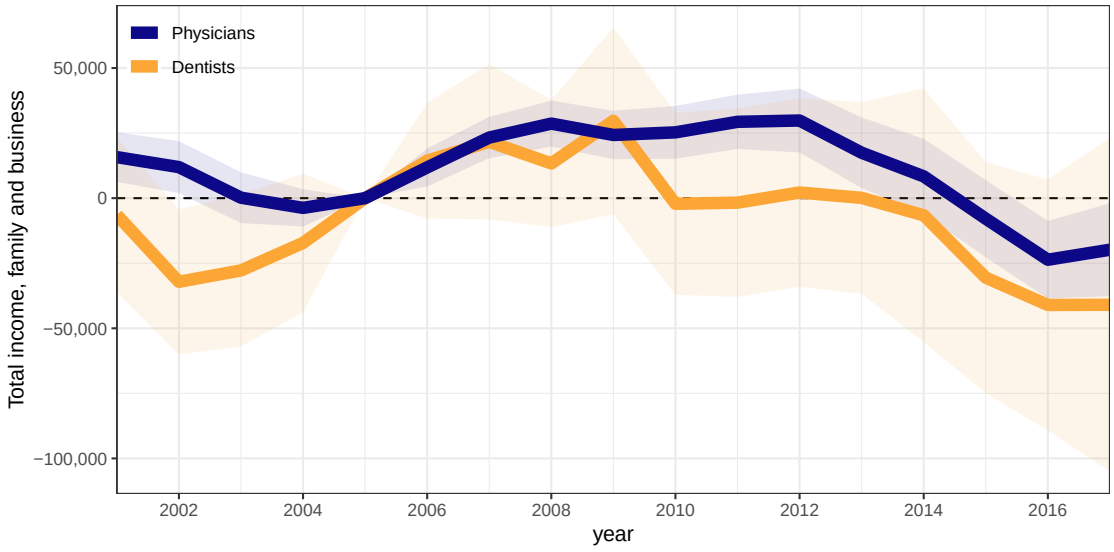
and dentists *Notes*: Estimated treatment effects of the 2006 Ontario reform for male and female doctors separately. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 8: Comparison of the effects on physicians and dentists

(a) Incorporation rate



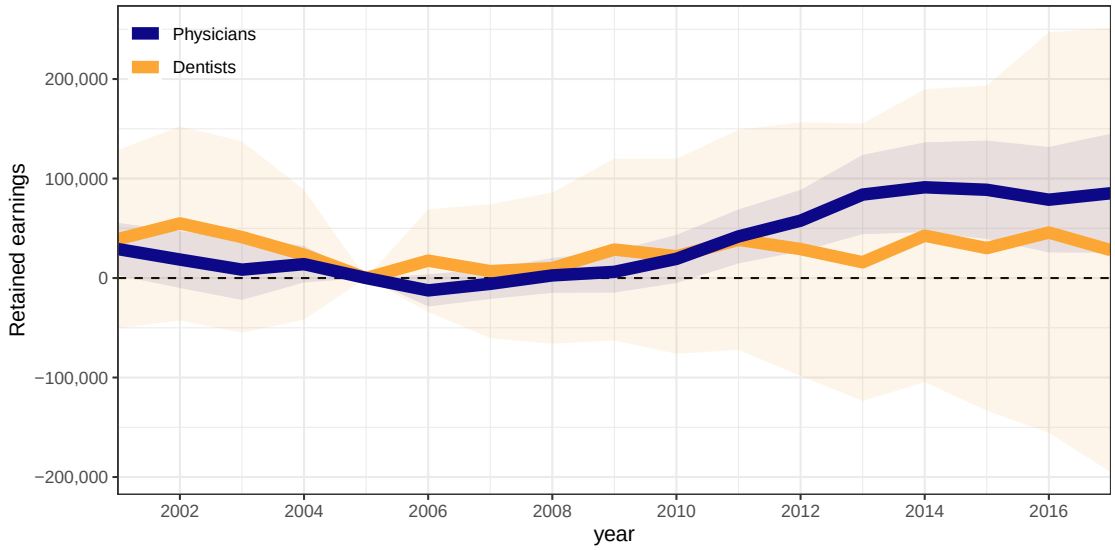
(b) Total income



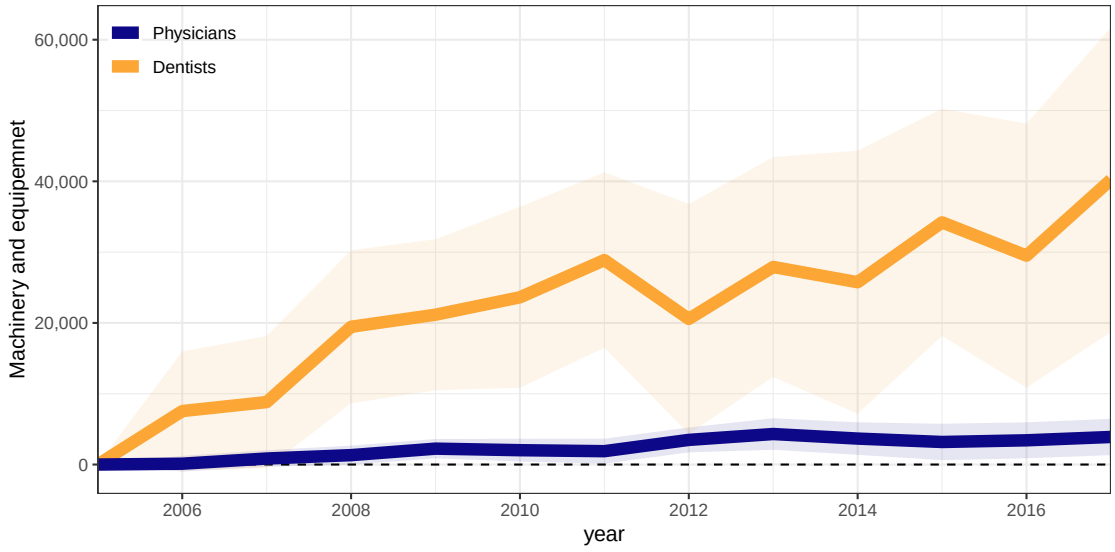
Notes: Estimated treatment effects of the 2006 Ontario reform for physicians and dentists separately. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 8: Comparison of the effects on physicians and dentists (continued)

(c) Retained earnings



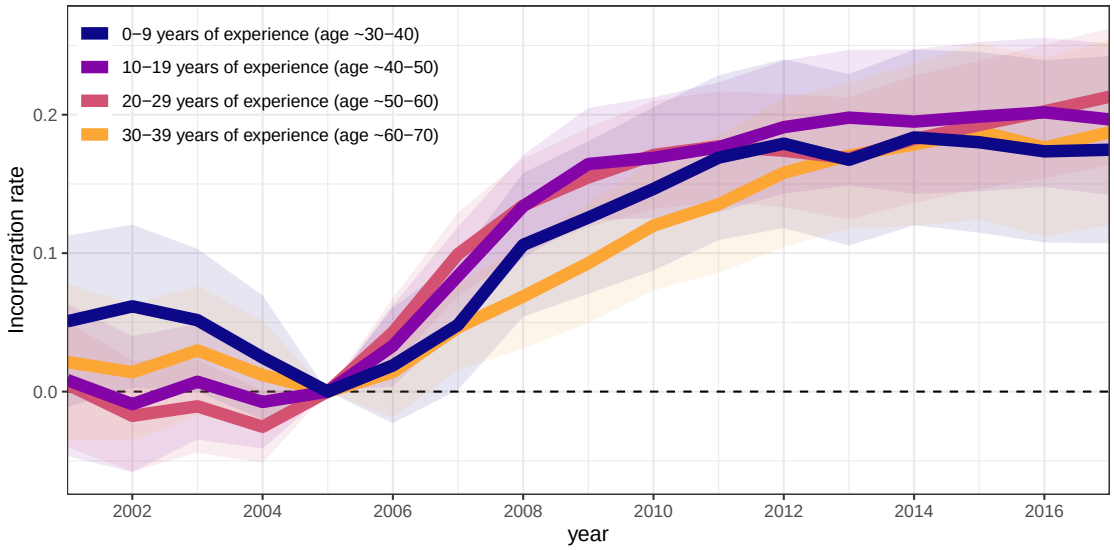
(d) Machinery and equipment investment



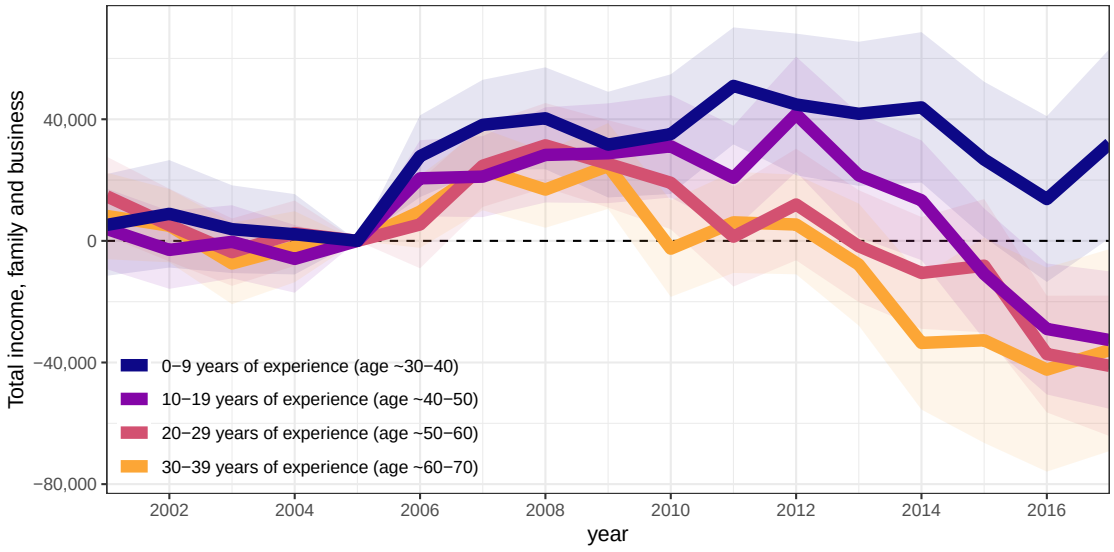
Notes: Estimated treatment effects of the 2006 Ontario reform for physicians and dentists separately. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 9: Reform effects by years of experience cohort

(a) Incorporation



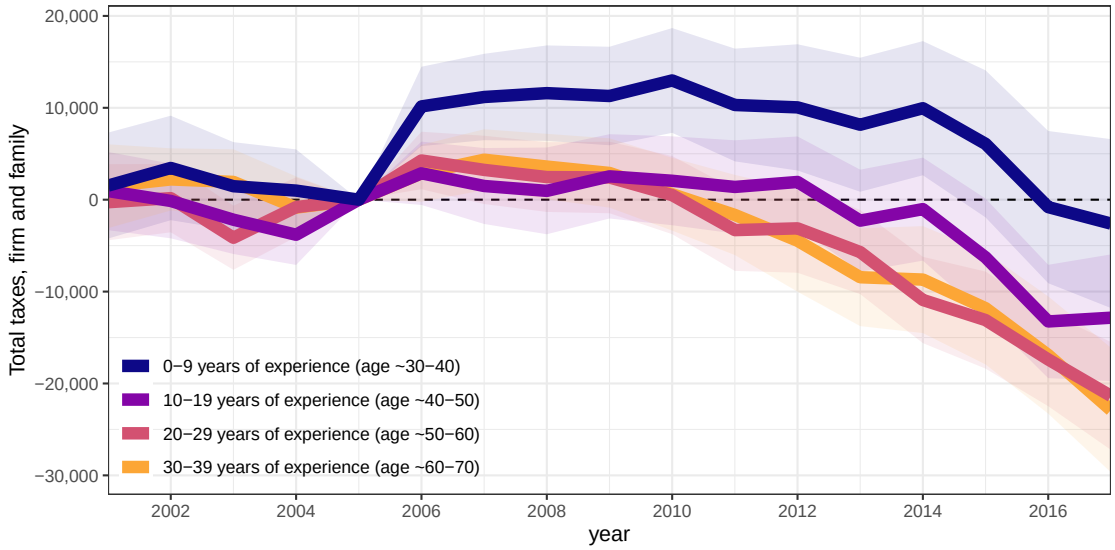
(b) Total incomes



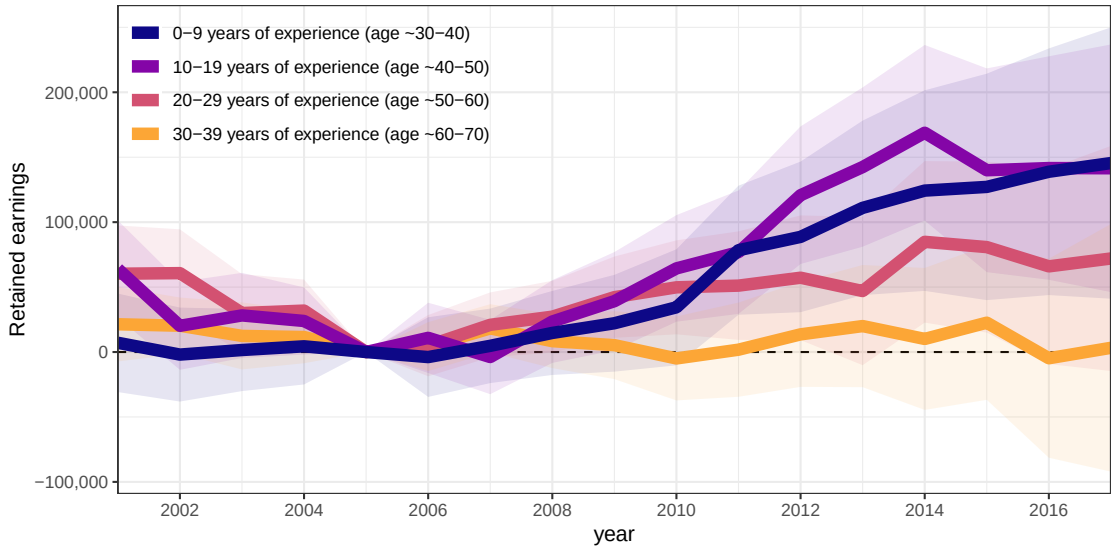
Notes: Estimated treatment effects of the 2006 Ontario reform by birth cohort of the doctor. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 9: Reform effects by years of experience (continued)

(c) Total taxes paid



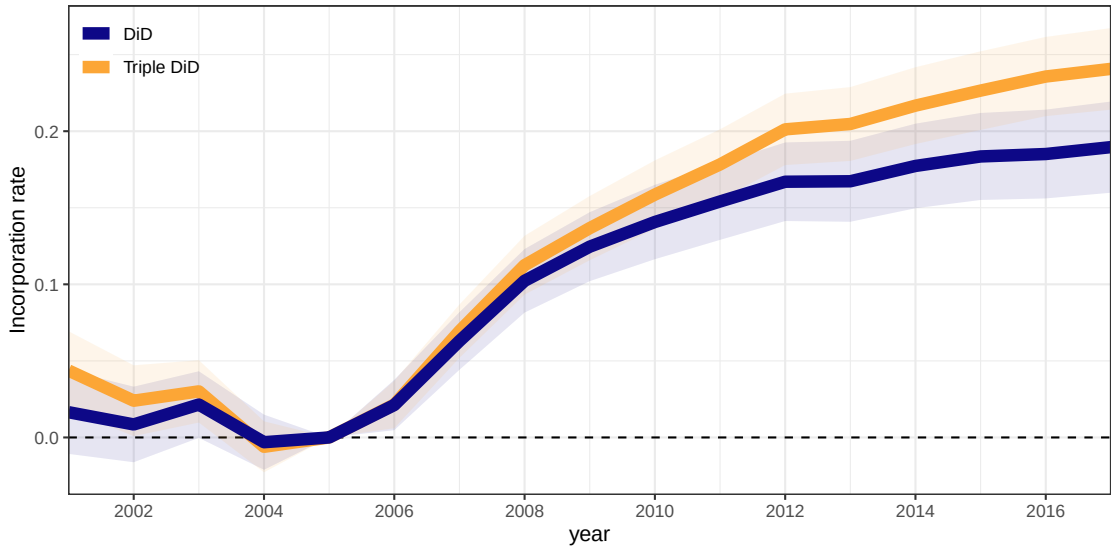
(d) Retained earnings



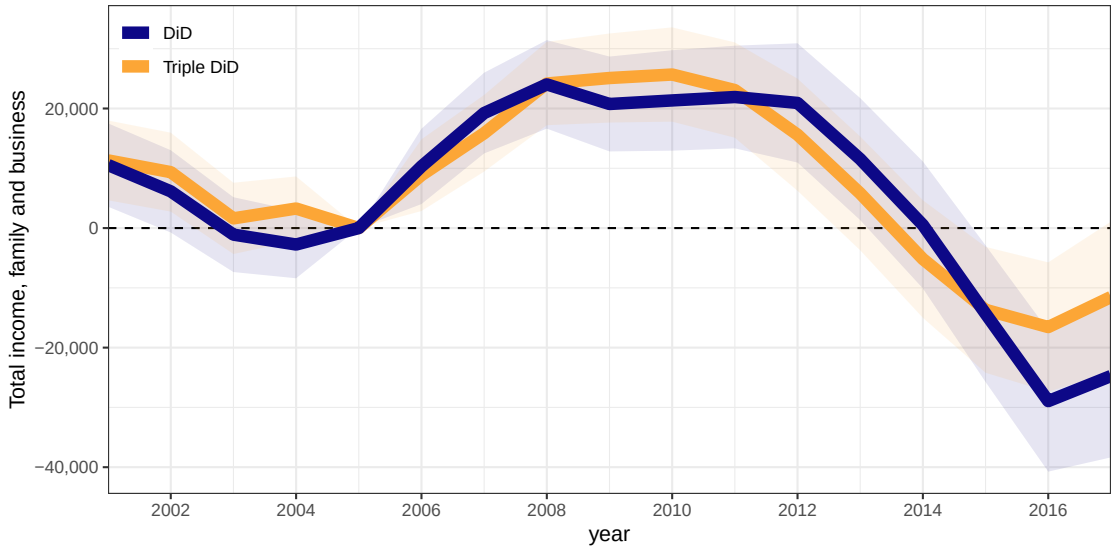
Notes: Estimated treatment effects of the 2006 Ontario reform by birth cohort of the doctor. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 10: Robustness: difference-in-difference

(a) Incorporation rate



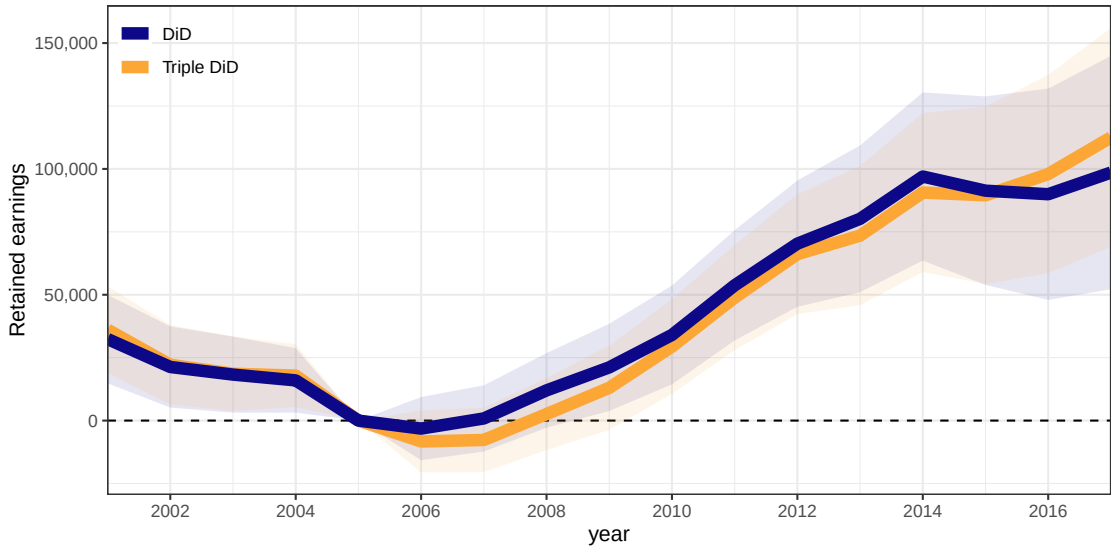
(b) Total income



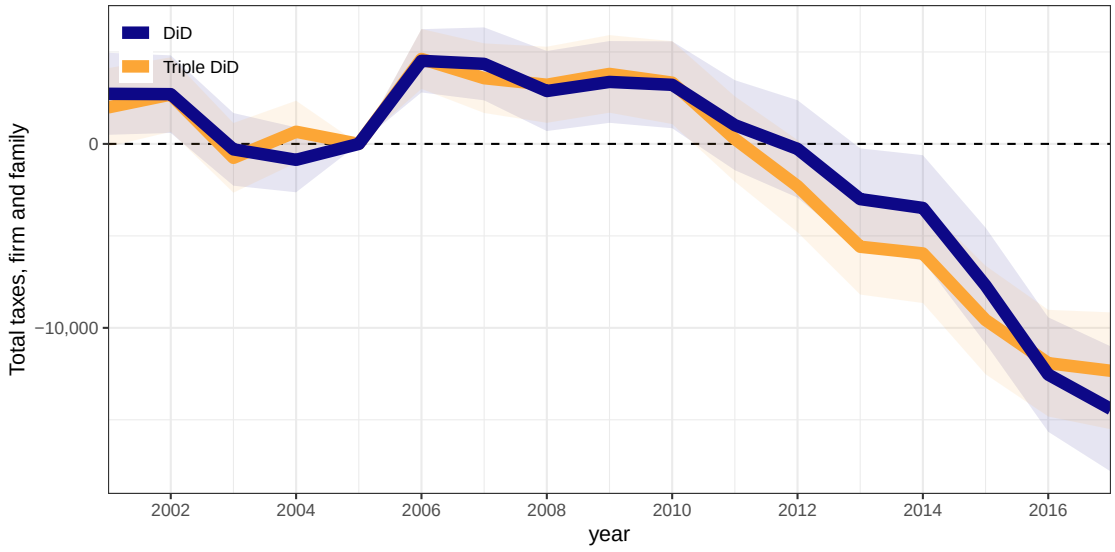
Notes: Estimated treatment effects of the 2006 Ontario reform based difference-in-difference strategy compared to our default tripe-difference approach. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Figure 10: Robustness: difference-in-difference (continued)

(c) Retained earnings



(d) Total taxes



and dentists *Notes*: Estimated treatment effects of the 2006 Ontario reform based difference-in-difference strategy compared to our default tripe-difference approach. The solid vertical line indicates the reform year. Shaded are 95 percent confidence intervals.

Table 1: Descriptive Statistics on Matched Sample (pre-reform)

	Ontario		Other Provinces	
	Doctors	Others	Doctors	Others
Overall Income	295,024	160,372	229,902	109,029
Overall Taxes	82,011	36,187	48,583	19,291
Average Tax Rate	0.24	0.16	0.23	0.15
Age	46.7	45.2	43.9	44.8
Male	0.62	0.62	0.55	0.62
Married	0.80	0.82	0.81	0.80
Family Size	2.93	3.08	2.93	2.96

Note: This table reports descriptive statistics on doctors in Ontario and other provinces, as well as their matched control business owners across provinces. Overall income is the sum of both pre-tax personal income and pre-tax business income. Average tax rates are defined as the total taxes paid scaled by overall taxable income. All of these variables are measured as pre-reform averages.

Table 2: Reform Effects on Incorporation, Income and Taxes

	Incorporation rate	Total income	Deferred income	Personal income	Total taxes	Average tax rate
Incorporation reform	0.112***	7,514**	19,753***	-8,995***	-1,198	-0.004**
	(0.010)	(3,021)	(1,882)	(2,494)	(927)	(0.002)
Observations	897,760	897,760	897,760	897,760	897,760	897,240
R^2	0.731	0.792	0.436	0.803	0.811	0.670
Pre-reform mean	0.177	300,384	16,315	292,654	85,730	0.242
Treated clusters	34,680	34,680	34,680	34,680	34,680	34,680
Control clusters	44,540	44,540	44,540	44,540	44,540	44,520

Note: This table reports the triple-differences estimates for the impact of the reform on the family-level outcomes. The standard errors are clustered at the family level.

Table 3: Reform Effects on Personal and Employment Income of Spouses

	Personal income		Employment income		Dividend income	
	Doctor	Spouse	Doctor	Spouse	Doctor	Spouse
Incorporation reform	-8,430*** (1,579)	-3,013** (1,274)	-12,462*** (1,547)	-3,769*** (1,076)	1,439* (760)	-176 (689)
Observations	897,760	897,760	897,760	897,760	897,760	897,760
R^2	0.717	0.685	0.691	0.661	0.463	0.495
Pre-reform mean	182,401	88,015	165,664	76,282	1,108	670

Note: This table reports the triple-differences estimates for the impact of the reform on total, labor and dividend income of the two spouses separately. The standard errors are clustered at the family level.

Table 4: Reform Effects on Real Firm Outcomes

	Employment	Spouse as an employee	Machinery and equipment	Total revenue
Incorporation reform	0.881***	0.046***	6,390***	167,694***
	(0.057)	(0.009)	(623)	(12,806)
Observations	897,760	897,760	897,760	897,760
R^2	0.655	0.511	0.599	0.346
Pre-reform mean	0.686	0.000	2,079	145,091

Note: This table reports the triple-differences estimates for the impact of the reform on firm-level outcomes. The standard errors are clustered at the family level.

Table 5: Reform Effects on Incorporation, Income and Taxes by Gender

	Incorporation rate	Total income	Total taxes	Average tax rate	Machinery and equipment	Retained earnings in 2017
	Men					
Incorporation reform	0.153***	7,467**	-2,411**	-0.007***	6,660***	151,547***
	(0.012)	(3,629)	(1,138)	(0.003)	(805)	(29,295)
Observations	514,730	514,730	514,730	514,500	514,730	514,730
R^2	0.754	0.796	0.810	0.675	0.598	0.668
Pre-reform mean	0.169	309,021	90,394	0.252	2,025	24,619
	Women					
Incorporation reform	0.092***	11,710**	1,527	0.002	6,146***	46,507
	(0.016)	(4,653)	(1,397)	(0.003)	(880)	(36,128)
Observations	301,250	301,250	301,250	301,010	301,250	301,250
R^2	0.747	0.787	0.809	0.651	0.602	0.655
Pre-reform mean	0.154	273,176	77,192	0.232	2,012	24,890

Note: This table reports the triple-differences estimates for the impact of the reform separately for men and women. The standard errors are clustered at the family level.

Table 6: Reform Effects on Incorporation, Income and Taxes for Physicians and Dentists

	Incorporation rate	Total income	Total taxes	Average tax rate	Machinery and equipment	Retained earnings in 2017
	Physicians					
Incorporation reform	0.075***	12,058***	800	-0.004*	3,054***	85,243***
	(0.012)	(3,680)	(1,127)	(0.002)	(613)	(30,561)
Observations	639,740	633,960	633,960	633,560	633,960	633,960
R^2	0.732	0.812	0.816	0.684	0.607	0.658
Pre-reform mean	0.140	299,546	87,798	0.250	1,137	15,940
	Dentists					
Incorporation reform	0.134***	15,925	1,183	0.006	19,553***	27,998
	(0.043)	(12,418)	(3,515)	(0.008)	(4,946)	(113,904)
Observations	195,930	194,310	194,310	194,220	194,310	194,310
R^2	0.738	0.740	0.799	0.616	0.635	0.688
Pre-reform mean	0.281	278,403	75,527	0.222	8,753	61,384

Note: This table reports the triple-differences estimates for the impact of the reform separately for physicians and dentists. The standard errors are clustered at the family level.

Table 7: Reform Effects on Incorporation, Income and Taxes by Age

	Incorporation rate	Total income	Total taxes	Average tax rate	Machinery and equipment	Retained earnings in 2017
	0-9 years of experience (age ∼30-40)					
Incorporation reform	0.086***	30,681***	7,099***	0.004	15,419***	145,511***
	(0.023)	(7,821)	(2,579)	(0.005)	(1,387)	(53,301)
Observations	162,390	162,390	162,390	162,280	162,390	162,390
R^2	0.694	0.769	0.779	0.640	0.606	0.637
Pre-reform mean	0.116	215,836	56,864	0.213	1,355	9,740
	10-19 years of experience (age ∼40-50)					
Incorporation reform	0.145***	15,887***	-71	-0.001	5,396**	141,497***
	(0.019)	(5,527)	(1,757)	(0.004)	(2,144)	(48,644)
Observations	273,500	273,500	273,500	273,280	273,500	273,500
R^2	0.715	0.799	0.822	0.663	0.594	0.659
Pre-reform mean	0.193	299,012	87,619	0.247	2,470	27,293
	20-29 years of experience (age ∼50-60)					
Incorporation reform	0.154***	2,137	-2,233	-0.002	4,031***	72,024
	(0.017)	(4,987)	(1,461)	(0.003)	(991)	(44,221)
Observations	275,750	275,750	275,750	275,590	275,750	275,750
R^2	0.748	0.794	0.820	0.664	0.624	0.679
Pre-reform mean	0.196	339,405	100,306	0.253	2,655	33,260
	30-39 years of experience (age ∼60-70)					
Incorporation reform	0.085***	5,153	-1,786	0.000	1,942*	3,248
	(0.022)	(5,781)	(1,654)	(0.005)	(1,039)	(48,647)
Observations	186,340	186,340	186,340	186,320	186,340	186,340
R^2	0.798	0.796	0.804	0.700	0.656	0.694
Pre-reform mean	0.175	281,480	79,798	0.242	1,807	26,998

Note: This table reports the triple-differences estimates for the impact of the reform separately for different experience cohorts. The standard errors are clustered at the family level.

Table 8: Revenue and Welfare Effects of Reform

	Years of Experience				
	All	0-9	10-19	20-29	30-39
Mechanical	-4654***	-7015	-7379**	-3216	-4157
	(1670)	(4427)	(3091)	(2720)	(3131)
Behavioral	3456**	14113***	7308***	983	2370
	(1390)	(3598)	(2543)	(2294)	(2659)
Total	-1198	7099***	-71	-2233	-1786
	(927)	(2579)	(1757)	(1461)	(1654)
MVPF	3.9	$+\infty$	103.8	1.4	2.3

* p<0.10, ** p<0.05, *** p<0.01.

Notes: Shows the decomposition of estimated revenue effects of the reform into mechanical and behavioral effects, by experience cohort. Behavioral effect is the estimated treatment effect on total income, times the personal marginal tax rate of 46 percent. The mechanical effect is the residual: the implied change in tax liabilities due to the reform, in the absence of behavioral effects. See text for details.