

# Permanent and Transitory Responses to Capital Gains Taxes: Evidence from a Lifetime Exemption in Canada\*

Adam M. Lavecchia<sup>†</sup>     Alisa Tazhitdinova<sup>‡</sup>

## Abstract

Using panel data on a 20% random sample of Canadian taxpayers, we study behavioral responses to the cancellation of a lifetime capital gains exemption. Coupled with contemporaneous tax changes, the setting allows us to distinguish between short-term avoidance responses and permanent responses to capital gains taxes. We show that the exemption did not increase the number of taxpayers reporting positive capital gains, and thus unlikely resulted in increased participation in capital markets. However, the reform slightly increased capital gains realizations of the existing traders.

**JEL Classification:** H24, H31, G51

**Keywords:** capital gains tax, real responses, avoidance, re-timing

---

\*Acknowledgements: We are grateful to Alan Auerbach, Jon Bakija, Youssef Benzarti, William Gentry, Arjan Lejour, Kevin Milligan, Jim Poterba, Emmanuel Saez and seminar participants at Williams College, 7th Annual Mannheim Conference and International Online Public Finance Seminar for helpful comments. We thank Ae Jin Kim for research assistance. This research was supported by funds to the Canadian Research Data Centre Network (CRDCN) from the SSHRC, the Canadian Institute for Health Research (CIHR), the Canadian Foundation for Innovation (CFI), and Statistics Canada. Although the research and analysis are based on data from Statistics Canada, the opinions expressed do not represent the views of Statistics Canada.

<sup>†</sup>Address: McMaster University, Department of Economics and IZA. Kenneth Taylor Hall, Room 412, 1280 Main Street West, Hamilton, Ontario L8S 4M4. Email: [laveccha@mcmaster.ca](mailto:laveccha@mcmaster.ca)

<sup>‡</sup>Address: University of California, Santa Barbara, Department of Economics and NBER. 2127 North Hall, Santa Barbara, California 93106-9210. Email: [tazhitda@ucsb.edu](mailto:tazhitda@ucsb.edu)

How does taxation affect the realization of capital gains? The answer to this question is central to several ongoing debates in the academic public finance literature and in policy circles, and has important implications on income inequality and economic efficiency. For example, the elasticity of capital income with respect to the net-of-tax rate is an input into formulas for optimal tax rates on capital (Saez and Stancheva (2018)). The elasticity of capital gains realizations with respect to taxes is also important for estimating the impact of tax reforms on government revenues (Gravelle (2020); Agersnap and Zidar (2020)). In spite of its importance, evidence on the responsiveness of capital gains realizations to changes in taxation is mixed, largely due to limitations in data and identifying variation.

In this paper, we exploit the unexpected cancellation of a \$100,000 CAD (nominal) lifetime capital gains exemption in 1994 and longitudinal tax return data on a 20% sample of Canadian tax filers to estimate the effect of taxes on short-run and long-run capital gains realizations. Introduced in 1985, the lifetime capital gains exemption (hereafter the LCGE) resulted in an effective marginal tax rate on capital gains of zero up to the \$100,000 threshold. Broadly speaking, the abrupt elimination of the LCGE in February 1994 affected tax filers in one of two ways, depending on their expected path of lifetime capital gains realizations and past behavior. Firstly, for individuals whose expected lifetime capital gains realizations were less than \$100,000, the elimination of the LCGE led to both an increase in the marginal effective tax rate on capital gains income and a negative shock to expected lifetime wealth.<sup>1</sup> Secondly, individuals who had already exhausted their \$100,000 exemption limit were unaffected by the 1994 reform.

Our event-study research design compares the capital gains realizations of individuals in one of several treated groups to individuals in a control group, before and after the 1994 reform. We assign individuals to treatment and control groups based on the sum of their 1985-1993 capital gains realizations that counted

---

<sup>1</sup>The increase in the effective marginal tax rate on capital gains from 1994 to 1995 meant that the after-tax real return to earning capital income fell sharply from 1995 onwards. Furthermore, the fact that realizations up to \$100,000 were subjected to taxation meant that lifetime wealth fell by an amount equal to an individual's remaining exemption space multiplied by their marginal tax rate on capital gains income.

towards the LCGE limit, using this sum as a proxy for lifetime capital gains. By construction, the control group is comprised of tax filers that exhausted their LCGE limit by 1993 and, therefore, were unaffected by the 1994 reform. We assign individuals whose 1985-1993 realizations were below the the LCGE limit to one of three treatment groups based on how far below the \$100,000 limit their pre-reform realizations were. Separating treated individuals into three groups based on their pre-reform realizations allows us to investigate the extent to which the elimination of the LCGE affected individuals differently.

Our analysis generates two main results. First, we find that the elimination of the LCGE led to a large increase in realizations in 1994, the last year the LCGE was available, for all treatment groups. Compared to untreated tax filers whose realizations did not jump in 1994, the unconditional realized capital gains of treated filers approximately doubled, increasing by 0.9 to 1.1 log points from 1993 to 1994. Furthermore, we show that this short-term increase in unconditional capital gains is driven by responses along both the extensive (i.e. the likelihood of reporting capital gains) and the intensive margins (i.e. the amount of realized capital gains, conditional on reporting).

Second, although responses by all three treatment groups are qualitatively similar in the short-run, our estimated medium to long-run responses (i.e. 3-5 years) differ across groups. For treated filers whose 1985-1993 realizations were close to \$100,000, and who therefore were more likely to eventually exceed the limit, we find that the elimination of the LCGE had a small, statistically insignificant effect on 1995-1999 realized capital gains. However, for treated individuals whose 1985-1993 realized capital gains were far from the \$100,000 limit, we find that the elimination of the LCGE increased (unconditional) capital gains realizations by approximately 0.25 log points (i.e. 25 percent). We show that this increase is primarily due increases along the intensive rather than extensive margin.

In Section 4 of the paper, we address three potential concerns with our empirical strategy and argue that our null and positive estimated long-term responses to the elimination of the LCGE are not due to estimation bias. The first potential concern is that our proxy for lifetime capital gains is imperfect and we mistakenly misclassify some individuals with pre-reform realizations below \$100,000 who

would have eventually exceeded the limit in the absence of the elimination of the LCGE. For these tax filers, the elimination of the LCGE generated an incentive to bring forward future expected realizations to 1994 but would have had no effect on their lifetime wealth. Misclassifying these tax filers as treated will tend to bias our estimates of the long-run impact of capital gains taxes towards zero. We address this concern in two ways. First, we report estimate the causal effect of the elimination of the LCGE separately for three different treatment groups, including those whose tax filers have low 1985-1993 capital gains and, therefore, as less likely to be misclassified. Second, we check the sensitivity of our baseline estimates by focusing on tax filers over age 65. Arguably, our pre-reform proxy for lifetime capital gains is better for this group given that they face less uncertainty about earnings and retirement income needs. Reassuringly, our estimates are similar for the over age 65 sub-sample as our baseline sample.

A second concern is that our estimates of the medium and long-run response to the LCGE are biased downwards because treated tax filers brought forward capital gains realizations to 1994, leading to lower realizations in subsequent years. However, to the extent that our estimated medium and long-run responses are biased downwards because of the nature of the 1994 reform, the true long-run response of capital gains realizations to taxes is even more positive than we find. Finally, a third concern is that defining treatment and control groups based on past behavior may be problematic if capital gains are mean-reverting. To address this concern, we define our treatment and control groups based on long series of capital gains realizations (9 years). Furthermore, our event study estimates show no evidence of diverging pre-trends between the treatment and control groups, suggesting that mean-reversion is unlikely to drive our results.

Taken together, our results provide suggestive evidence that the short-run elasticity of capital gains realizations with respect to the net-of tax rate is large and positive (2.92 to 3.7) while the medium and long-run elasticities are much smaller and negative in some cases (-0.16 to -1.16). Our short-run estimates are likely represent an upper bound on the potential magnitude of re-timing responses for two reasons. First, individuals were able to take advantage of the expiring exemption and crystalize their unrealized capital gains without selling their assets by filling out a form when completing their 1994 tax return. Since filling out this

form was essentially costless compared to the potential tax savings, our 1994 re-timing responses are likely to be larger than what would be observed for typical tax rate change. Second, taxpayers may have inflated their crystalized capital gains on assets that were not third-party reported, since doing so would reduce future tax liability without incurring a tax burden in 1994.<sup>2</sup>

We estimate that the long-run elasticity of capital gains realizations with respect to the net of tax rate is negative. This is consistent with the wealth effect arising from the elimination of the LCGE being relatively important in our setting. The sudden elimination of the LCGE represented a negative shock to lifetime wealth for tax filers that did not expect to exceed the \$100,000 limit. Furthermore, the elimination of the LCGE was not viewed as a transitory tax policy change (Richardson and Moore (1995)). Our results suggest that this wealth effect is likely to be particularly important for younger tax filers with modest prior realizations. On the other hand, long-run elasticities for those with larger pre-reform realizations tend to small and statistically insignificant. Strictly speaking, interpreting differences in elasticity estimates between treatment groups as being driven by the relative importance of the wealth effect for different tax filers requires us to assume that those with large and small 1985-1993 realizations have similar underlying structural elasticities. If this is not the case, the observed increase in capital gains realizations after the LCGE cancellation may represent differences in underlying structural elasticities (e.g. due to different preferences or discount factors) rather than wealth effect responses.

An important feature of our setting is that the LCGE limit of \$100,000 was relatively low and did not bind for the most affluent of Canadians. This means that our estimates may not be externally valid for tax changes that primarily affect high-income individuals. On the other hand, a key advantage of our setting is that the exemption created a large and clear change in capital gains taxation for a large portion of the population. The exemption rules were simple and salient and were in place for more than 10 years. This allows us to isolate real, long-run changes in realization behavior from transitory re-timing responses.

Our results contribute to several active literatures in public finance. A num-

---

<sup>2</sup> During this time period, capital gain realizations through banks and brokerage accounts were third-party reported to Canada Revenue Agency.

ber of papers study individual responses to capital gains taxation (Feldstein et al. (1980); Minarik (1981); Auten and Clotfelter (1982); Lindsey (1987); Poterba (1987); Auerbach and Poterba (1988); Auten et al. (1989); Slemrod and Shobe (1990); Gillingham and Greenless (1992); Burman and Randolph (1994); Bogart and Gentry (1995); Auerbach and Siegel (2000), Landsman et al. (2002); Dowd et al. (2015); Bakija and Gentry (2014); Agersnap and Zidar (2020)).<sup>3</sup> Compared with prior work, our setting allows for an arguably cleaner identification of both short-run and long-run responses to capital gains taxes. First, the elimination of the LCGE resulted in a tax policy change that was very salient and relatively simple for tax filers to understand, and that was large in magnitude – the elimination of the LCGE reduced the net of tax rate on income from realized capital gains from 1 to 1 minus a tax filer’s effective marginal tax rate. To contrast, most prior work estimates the impact of changes to statutory tax rates that are often small and mean-reverting (Agersnap and Zidar (2020)). Second, the nature of our setting provides a straightforward approach to estimating long-run responses of capital gains taxes without having to rely on potentially subjective measures of transitory and permanent tax changes. The legislation to eliminate the LCGE was initially introduced as part of the Government of Canada’s 1994 Budget as a way to help eliminate the federal deficit, and was reaffirmed in the 1995 Budget, reinforcing the perception that the elimination of the LCGE was not a transitory policy change. Third, the fact that the elimination of the LCGE had no effect on individuals whose prior capital gains realizations exceeded the \$100,000 limit (by definition) creates a natural comparison group. This is advantageous because an individuals’ treatment status is based on immutable past behavior rather than their endogenous marginal tax rates. Fourth, our event study research design permits a graphical presentation of the data that allows us to assess the short-run and long-run responses to the elimination of the LCGE. Finally, other than the elimination of the LCGE, the tax treatment of realized capital gains and other investments was stable during the 1990-1999 period we study.

Our findings also contribute to the literature that aims to understand the savings response to financial incentives (Bernheim (2002)). While our data do not allow us to observe changes in an individual’s overall financial position (e.g. actual

---

<sup>3</sup>For a recent summary of the literature, see Stantcheva (2020).

savings, home equity and debt are not observed), the lack of strong realization responses suggest that lower taxes may not necessarily increase savings. Thus our results are broadly consistent with findings from several recent studies that find weak responses to tax-advantaged savings accounts (Chetty et al. (2014); Manoli and Weber (2016); Messacar (2018)).<sup>4</sup>

The remainder of the paper is structured as follows. In Section 1, we discuss the features of the Canadian personal income tax system and the tax treatment of capital gains that are relevant for our setting. Section 2 describes the longitudinal dataset of individual tax returns used in the paper. In Section 3, we present descriptive time series evidence on capital gains realizations in Canada from 1982 to the present. In Section 4, we describe our empirical strategy for estimating the causal effect of the elimination of the LCGE, present the main results and review several robustness checks. Section 5 concludes and discusses some promising avenues for future research.

## 1 Institutional Setting and Empirical Approach

### 1.1 Capital Taxation in Canada

Table 1 summarizes the tax rules applicable to capital gains and top marginal income tax rates in Canada for the years we study. The tax rules for other years, as well as for dividends and tax-deferred savings accounts are available in Appendix Tables A.1–A.2.

In Canada, the tax unit is the individual (rather than the couple or family) and the period of taxation is the calendar year. Realized capital gains have been taxed in Canada since 1972.<sup>5</sup> An individual’s taxable capital gains income is

---

<sup>4</sup>Our administrative tax return data contains information on annual contributions to tax-deferred retirement savings accounts as well as income from dividends and interest at the individual level. We use this information to investigate the extent to which the elimination of the LCGE affected income from sources other than realized capital gains. We find that these other forms of income were not significantly affected by the change in the tax incentive for saving caused by the elimination of the LCGE.

<sup>5</sup>In 1962, Prime Minister John Diefenbaker set up a commission to study the entire federal tax system and recommend changes for Parliament to enact. The resulting Report of the Royal Commission on Taxation (the Carter Commission) of 1966 recommended broad changes, most notably a shift towards a comprehensive definition of income as the base for taxation. A more

equal to their realized gains in a calendar year multiplied by the *inclusion rate*. Column 2 of Table 1 shows that the inclusion rate increased from 50% to 66.7% from 1987 to 1988 before increasing again to 75% in 1990. The rate remained stable from 1990-1999 before falling to 50% in 2001 (where it remains today). Increases (resp. decreases) in the inclusion rate push the tax base more towards (resp. away from) a comprehensive income definition. Realized capital gains from certain sources are exempt from taxation. Most notably, realized capital gains from the disposition of an individual's primary residence do not count towards taxable income (and were not even recorded on tax forms until 2016). Also, since 1985 the proceeds from the sale of a qualified farm property or a qualified small business property are exempt from taxation, up to a lifetime limit of \$500,000.<sup>6</sup>

In 1985 the federal government introduced the Lifetime Capital Gains Exemption (LCGE) with the goal of encouraging risk taking and competitiveness. The LCGE exempted from taxation the realized capital gains from the disposition of property other than farm property and small business property up to an annual limit. Examples of income eligible for the LCGE included realized capital gains from the sale of financial assets like stocks, bonds and mutual funds and the proceeds from the sale of secondary residences and rental properties. The LCGE was phased in gradually from \$20,000 in 1985, to \$50,000 in 1986-1987 and \$100,000 in 1988 onwards.

The LCGE was unexpectedly cancelled in February 1994 as part of the deficit reduction plans of the newly elected federal Liberal Party government. Although the planned reduction in the deficit was mostly achieved by reductions in the level and growth rate of federal spending, the LCGE was eliminated on the grounds that its beneficiaries were mostly high income earners who should participate in the austerity effort (Richardson and Moore (1995)).<sup>7</sup> The elimination of the

---

detailed review of the history of the taxation of capital income in Canada can be found in Richardson and Moore (1995).

<sup>6</sup>Note that the use of Lifetime Capital Gains Exemption discussed below reduced the remaining exemption space for the sale of qualified property. In other words, the \$500,000 exemption applied to the sum of all capital gains realizations.

<sup>7</sup>Notably, the elimination of the LCGE was not even anticipated by the participants of a symposium jointly sponsored by the Department of Finance and the Institute for Policy Analysis at the University of Toronto that was held on January 27-28, 1994. The announcement that the LCGE was being eliminated was made as part of the 1994 federal Budget presented to Parliament by Minister of Finance Paul Martin on February 22, 1994.



LCGE was reaffirmed in subsequent federal Budgets which reinforced perceptions that the policy change was permanent. To ease the transition, the federal government allowed individuals to utilize any unused LCGE space in 1994 on a one-time basis without having to sell their assets. Individuals were able to take advantage of this opportunity to crystalize their unrealized capital gains by filling out a form (Form T664) as part of their 1994 tax return.<sup>8</sup> Even though individuals did not have to sell their assets the crystalized capital gains generated by this one-time opportunity were recorded as realized capital income in tax returns and in our data described below.<sup>9</sup>

Tables 1 and A.2 summarize the tax treatment of other forms of capital income. Interest income (both from assets held in Canada and overseas) and dividends received from foreign firms are taxed at an individual’s ordinary marginal tax rate. In contrast, dividends from domestic forms (referred to as ‘eligible dividends’) receive preferential treatment. Taxable dividend income is equal to an individual’s nominal dividend payment multiplied by one plus a gross-up factor. Federal gross up factors for eligible dividends ranged from 25% to 50% over the past 4 decades but were stable at 25% during the 1990-1999 period. To compensate for the fact that dividend income is grossed-up individuals may claim a (non-refundable) dividend tax credit on their taxable dividend income. The tax credit for eligible domestic dividends was stable at 13.3% during the 1990-1999 period.<sup>10</sup> The gross-up factor and tax credit system is designed to offset the prepaid taxes on corporate profits.

The Canadian personal income tax system also features tax subsidies for retirement saving through Registered Retirement Savings Plans (RRSPs) and

---

<sup>8</sup>The Form T664 allowed individuals to crystalize their unrealized capital gains by artificially and appropriately increasing the cost base of their assets up to their unused LCGE space. The untaxed crystalized (unrealized) capital gain is the difference between the new artificial cost base and the original cost base.

<sup>9</sup>Unlike the United States, a tax filer’s death results in Canada in a “deemed disposition” and, therefore, a capital gains liability on the appreciated assets. Married couples can avoid or delay such tax liability through a “spousal rollover,” which defers the disposition until the death of the second spouse.

<sup>10</sup>To illustrate how the gross-up and tax credit work, consider a tax filer with \$100 in eligible dividend income in 1995 and a marginal tax rate of  $\tau \in [0, 1)$ . After the gross-up, the individual’s federal taxable dividend income is \$125 ( $= \$100 \times 1.25$ ); their federal dividend tax credit is \$16.625 ( $= \$125 \times 0.133$ ). Their after-tax dividend income is  $\$100 - \$125(\tau - 0.133) > \$100(1 - \tau)$ .

Table 1: Summary of Tax Rules and Rates

Year	Capital Gains:			Income Tax:				
	Inclusion Rate	Lifetime Exemptions:		# of Tax Brackets	Federal MTR:		Provincial Top MTRs:	
		General	Small Business		Top MTR Cutoff	Top MTR	Range	Median
1982	0.5	0		10	53,376	34	13 - 33	18
1983	0.5	0		10	56,592	34	13 - 33	19
1984	0.5	0		10	59,424	34	13 - 33	19
1985	0.5	20,000	500,000	10	62,160	34	15 - 33	19
1986	0.5	50,000	500,000	10	62,657	34	15 - 28	19
1987	0.5	50,000	500,000	10	63,347	34	15 - 28	19
1988	0.667	100,000	500,000	3	55,000	29	12 - 26	17
1989	0.667	100,000	500,000	3	55,605	29	12 - 24	17
1990	0.75	100,000	500,000	3	56,550	29	13 - 24	18
1991	0.75	100,000	500,000	3	57,568	29	13 - 24	18
1992	0.75	100,000	500,000	3	59,180	29	13 - 24	19
1993	0.75	100,000	500,000	3	59,180	29	13 - 26	20
1994	0.75	100,000	500,000	3	59,180	29	13 - 27	20
1995	0.75	0	500,000	3	59,180	29	13 - 27	20
1996	0.75	0	500,000	3	59,180	29	13 - 26	20
1997	0.75	0	500,000	3	59,180	29	13 - 27	19
1998	0.75	0	500,000	3	59,180	29	13 - 27	19
1999	0.75	0	500,000	3	59,180	29	13 - 27	19
2000	0.667	0	500,000	3	60,009	29	13 - 25	18
2001	0.5	0	500,000	4	100,000	29	10 - 30	17

*Notes:* This table summarize tax rules for capital gains and income tax rates. Information for years 2002-2015 is available in Appendix Table [A.1](#).

employer-sponsored Registered Pension Plans (RPPs). RRSPs are similar to Individual Retirement Accounts (IRAs) in the U.S. in that contributions are deductible from taxable income, investment income accumulates tax-free and withdrawals are taxable. Individual contributions to RRSPs cannot exceed an annual limit: a certain percentage of the tax filer’s annual earnings (18%-20% during our period of study) up to a maximum amount. The nominal value of the maximum RRSP contribution limit increased in recent decades from \$5,500 in 1982 to \$27,830 in 2020; unused contribution from one year can be carried forward indefinitely to future years. Annual contributions to employer-sponsored RPPs reduce an individual’s RRSP contribution room.

## 2 Data

This paper uses individual tax return data from the Longitudinal Administrative Databank (LAD).<sup>11</sup> The LAD is a panel of 20% of Canadian tax filers; each year, 20% of new filers are selected into the sample. Once in the LAD, individuals are followed each year they file a return and are linked across years using their Social Insurance Number (SIN). Although the most recent version of the LAD spans the 1982-2016 period, most of our analysis below will use information for the 1990-1999 window surrounding the elimination of the LCGE.

Changes over time in the number of individual-year observations in the LAD reflect increases in the Canadian population and the fraction of individuals filing a return. Though unlikely to affect our estimates, two policy changes in the late 1980s increased fraction of individuals at the bottom of the income distribution that file a return. The Federal Sales Tax and Goods and Services Tax (GST) tax credits were introduced in 1986 and 1989, respectively. These refundable tax credits are designed to offset the sales and value added taxes on consumption goods and services for low income Canadians. Receipt of these credits require filing a tax return. Following the introduction of these tax credits, the number of Canadians filing a return increased before stabilizing by the early 1990s.

The LAD includes information on basic demographic characteristics (age, sex, family composition) and immigration status, where applicable (e.g. year

---

<sup>11</sup>See <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4107>.

of landing in Canada, origin country). Furthermore, for all individuals selected into the LAD, some information on their spouse and children is available (if applicable). We use this information to investigate whether the response to the change in tax incentives affects individuals differently depending on their marital status and family composition.

Information on realized net capital gains and taxable net capital gains is available for all years. For 1994, the reported capital gains include the unrealized crystalized gains claimed by tax filers taking advantage of the expiring LCGE. In other words, the reported net realized capital gains in 1994 are the sum of realized capital gains and “deemed” realizations from the filing of Form T664. Unfortunately, the LAD does not contain a detailed breakdown of capital gains by source. This means that some of the capital gains we observe may be due to distributions from mutual funds or other investments that are outside of an individual’s control. Unless individuals in our ‘treated’ groups began receiving more (or less) capital gains from these distributions after 1994 compared to the control group, we view the income from these passive sources as adding noise to out estimates.

The LAD also contains information on income from other sources including earnings, dividends (eligible and foreign/ineligible) and interest. Beginning in 1986, information on the amount of capital gains exemptions claimed by tax filers on their annual return is available. However, we do not observe whether the exemptions claimed are due to the general \$100,000 LCGE or the \$500,000 qualified small business exemption.<sup>12</sup>

For the purposes of this study, we make a number of sample restrictions. First, we drop tax returns filed on behalf of deceased persons. As mentioned earlier, the observed realized capital gains for individuals that pass away during a calendar year may be due in part to the required deemed disposition at death. Second, to avoid bias from extreme observations, we drop year-person observations with realized annual capital gains exceeding \$500,000 in 1982 dollars (equivalent to just over \$1.1 million in 2016 dollars).

Finally, Statistics Canada requires that all researchers working with the LAD

---

<sup>12</sup>The impact elimination of the LCGE is easily observed in the data with the mean exemption claimed falling by more than 80 percent after 1994.

abide by statistical confidentiality rules. These rules do not allow the release of raw summary statistics.<sup>13</sup> Consequently, all summary statistics (both figures and tables) presented in this paper are calculated using a two-step procedure. First, a small amount of noise is added to the variable underlying the summary statistic. Second, the resulting statistic (e.g. mean, median) is rounded according to the following rules. Dollar estimates of less than \$1000 are rounded to the nearest \$10, while dollar estimates above \$1000 are rounded to the nearest \$100. All counts are rounded to base 5. The counts shown are inflated to represent the full population of Canadian tax filers from a 20% sample.

### 3 Time Series Evidence

In this section, we present time series evidence on the evolution of realized capital gains in Canada over the 1982-2016 period. This descriptive evidence illustrates how the introduction and elimination of the LCGE affected aggregate realized capital gains. Figure 1 plots the unconditional mean of net realized capital gains (in 1993 dollars) from 1982 to 2016 for all tax filers on the left axis.<sup>14</sup> The right axis plots the (inflation-adjusted) performance of the Standard and Poor's Toronto Stock Exchange Composite Index (TSECI). The shaded green area highlights the exemption period that lasted from 1985 to 1994. In spite of the large tax incentive provided by the LCGE, there is little evidence of increased realizations for the average tax filer. Average net realized capital gains increased during the first few years the exemption was in place before falling back to prior levels by 1990. The absence of strong response cannot be attributed to poor conditions in financial markets since the stock market performed well during this period. The large spike in realized capital gains in 1994 is a multiple of the average gains for any other year in the sample.<sup>15</sup>

Figure 2(a) plots the fraction of tax filers who report positive net capital gains

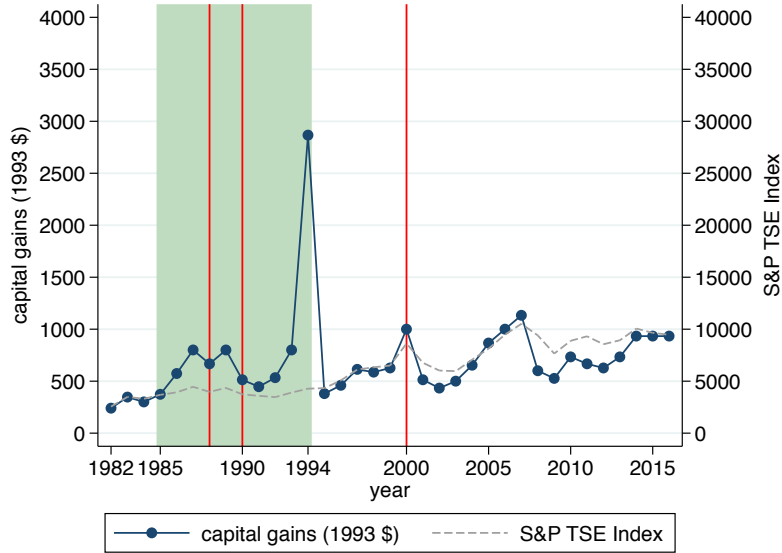
---

<sup>13</sup>To contrast, output based on regression models does not require that noise be added to the data or the resulting estimates.

<sup>14</sup>To convert 1993 dollars to 2016 dollars, multiply 1993 values by 1.5.

<sup>15</sup>Appendix Figure C.2 breaks down responses by the amount of reported capital gains and suggests that the spike in 1994 realizations was not due to a large number of very small realizations. Most of the bunching observed in 1994 is due to net capital gains reports of \$1,500 or more (equivalent to \$1000 in 1982 dollars).

Figure 1: Capital Gains Over Time

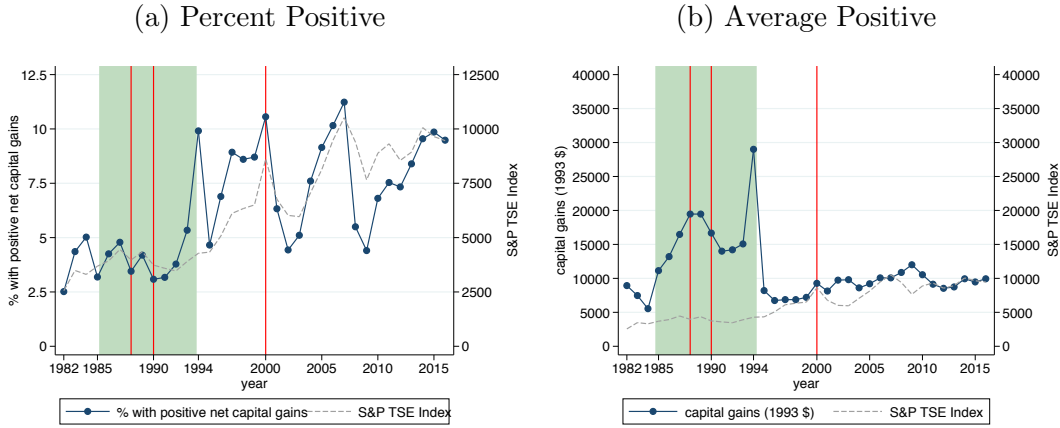


*Notes:* The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000. The dashed grey line shows the inflation-adjusted values of the Standard and Poor’s Toronto Stock Exchange Composite Index.

in a given year. The fraction of Canadian tax filers who reported positive capital gains has increased substantially over time, from approximately 2.5 percent of all filers in 1982 to nearly 10 percent in recent years. With the exception of the large spike in 1993-1994, the fraction of tax filers reporting positive capital gains did not increase substantially during the time the LCGE was in place. In the years since the LCGE was eliminated, the fraction of Canadians reporting positive capital gains has tended to be positively correlated with the performance of the TSECI.

Figure 2(b) plots the average realized capital gains of those making a positive contribution in 1993 dollars. After falling from 1982-1984, the average realized capital gain increased substantially from 1985-1990, before leveling off. One interpretation of this increase is that the introduction of the LCGE led to increased realizations among those reporting positive gains. However, another interpretation is that part of the observed increase may be due to a change in the

Figure 2: Capital Gains Over Time – Extensive and Intensive Margin Responses



*Notes:* The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000. The dashed grey line shows the inflation-adjusted values of the Standard and Poor’s Toronto Stock Exchange Composite Index.

composition of those reporting positive gains; the fraction reporting a positive capital gain fell from about 5 percent in 1984 to just over 2.5 percent in 1990. Furthermore, the average realized gain by positive contributors fell substantially after the elimination of the LCGE just as the fraction reporting positive gains was increasing.

Figures 2(a) and (b) also illustrate the small spikes in the number of individuals with net positive capital gains in 1987 and 1989 – the two years preceding the inclusion rate increases from 50% to 66.67% and 75%, respectively. Similarly, there is a spike in 2000 when the inclusion rate decreased from 75% to 50%.

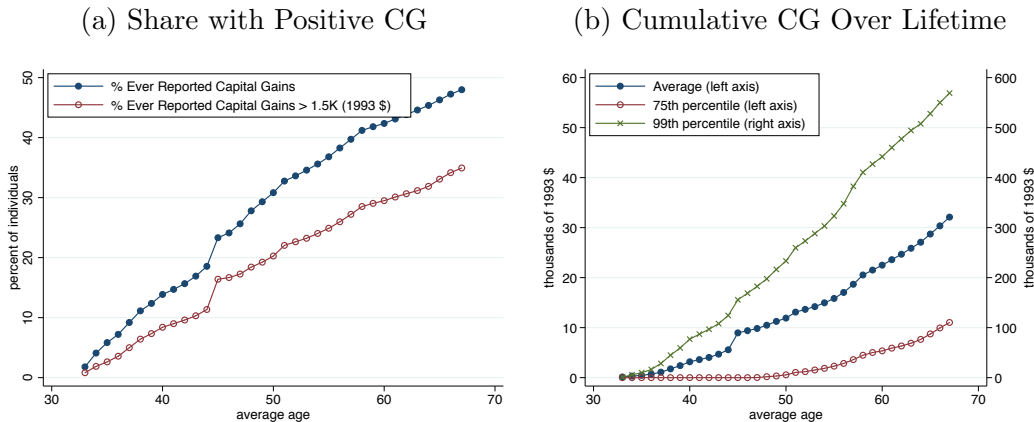
The fluctuations in the business cycle and the stock market make it difficult to disentangle the effects of tax changes on capital gains realizations from other economic forces. This motivates the need for a credible comparison group with which we can compare those affected by the elimination of the LCGE. This is the focus of our causal analysis in Section 4.

## 4 Causal Analysis

### 4.1 Identification Approach

To understand how the lifetime exemption affected different type of taxpayers, Figure 3 shows the evolution of reported capital gains for individuals who were 30-35 years old in 1982. Figure 3(a) plots the fraction of individuals who ever reported capital gains, while Figure 3(b) plots the average value of the “lifetime” capital gains. Figure 3 shows that over a 30 year period, nearly 50% of individuals report positive capital gains at least once on their tax return. However, for most individuals, the 30-year cumulative capital gains are small – with a median at zero (not shown), 75th percentile at \$10,000 and 99th percentile at just above \$500,000 (all 1993 dollars). Thus for the majority of individuals in Canada, a \$100,000 lifetime capital gains exemption was equivalent to a zero tax on capital gains.<sup>16</sup>

Figure 3: Capital Gains Over Lifetime



*Notes:* Figure (a) shows the percent of individuals who ever reported positive capital gains in their lifetime, or reported at least \$1500 (1993 dollars) at least once. Figure (b) shows average, 75th and 99th percentiles of cumulative capital gains over individuals’ lifetime. Both figures are constructed based on the sample of individuals who were 30-35 year old in 1982.

The introduction of the lifetime exemption in 1985 dramatically changed capital gains taxation for some groups of people. Specifically, for individuals

<sup>16</sup> Because the exemption was nominally fixed, the actual share of the population affected is strongly influenced by the inflation rate during individuals’ lifetime.



with relatively small capital gains, the lifetime exemption did not bind, and thus resulted in the effective elimination of the capital gains tax until exemption's repeal in 1994. On the other hand, for individuals with large capital gains, the lifetime exemption resulted in a one-time windfall which did not change the marginal incentives to realize capital gains.

In an ideal experiment, we would compare capital gains realizations of individuals who, in absence of any change in the LCGE, would realize with certainty more than \$100,000 worth of capital gains during their lifetime, to those who, with certainty, would realize less. Unfortunately, tax filers face uncertainty about their lifetime capital gains (both because of uncertainty about net financial returns which may be affected by changes in tax policy) and lifetime gains are only observed with certainty by individuals that are deceased. Furthermore, post-1994 realizations of tax filers are endogenous to the elimination of the exemption. Consequently, our approach relies on a proxy for lifetime capital gains and, in turn, the likelihood that any particular individual was affected by the elimination of the LCGE.

We use the sum of reported 1985-1993 capital gains as a proxy for lifetime capital gains. Let  $CG_{it}$  denote individual  $i$ 's reported capital gains in year  $t$ . Then our proxy for lifetime capital gains is given by  $Proxy_i = \sum_{t=1985}^{1993} CG_{it}$ . Our choice of proxy is driven by several considerations. First, our proxy is based on pre-1994 capital gains, and therefore is based on immutable pre-cancellation characteristics. Second, capital gains exhibit strong mean-reversion and therefore proxies based on just a few years of capital gains realizations are likely to rank individuals incorrectly. Relying on a large number of years gives us the greatest predictive power for lifetime capital gains.

We define treatment and control groups based on the value of  $Proxy_i$ . Our control group consists of tax filers whose 1985-1993 capital gains realizations were between \$100,000 and \$133,333 in 1993 dollars; all other individuals are considered to be treated.<sup>17</sup> because their cumulative realized capital gains exceeded the exemption threshold. On the other hand, those with values of  $Proxy_i$  less than \$100,000 include both individuals whose expected future capital gains real-

---

<sup>17</sup> The 2016 dollar value of the nominal \$100,000 exemption in 1993 was \$150,000. We deflate all dollar values to 2016 Canadian dollars using the Bank of Canada CPI Calculator (see <https://www.bankofcanada.ca/rates/related/inflation-calculator/>).

izations would see them exceed the LCGE threshold and those whose expected future capital gains realizations would not see them exceed the LCGE threshold. Since the elimination of the LCGE may have effected these groups of individuals differently, we divide those whose values of  $Proxy_i$  are less than \$100,000 into several treatment groups: (i)  $Proxy_i \in [\$66,667, \$100,000)$ , (ii)  $Proxy_i \in [\$33,334 - \$66,667)$ , and (iii)  $Proxy_i \in [\$667 - \$33,334)$ ; for most of the analysis below we restrict the last group to those with  $Proxy_i \in [16,667 - \$33,334)$ . Given that the average age of individuals in all three treatment sub-groups is similar (see Online Appendix E), those with lower values of  $Proxy_i$  are less likely to experience (counterfactual) capital gains realizations that would exceed the LCGE limit. In sensitivity checks below, we supplement our main analysis by restricting the sample to different age groups (young adults, middle age adults and senior citizens). Since the uncertainty over future capital gains is likely to be lower for older adults, the 1985-1993 proxy is more likely to be accurate for senior citizens. We show below that our results are qualitatively similar for all age groups.

For each treatment group  $k$ , we estimate the magnitude of unconditional and intensive margin responses using specification:

$$\log(CG_{it}) = \alpha + \beta \cdot Treat_i^k + \delta_t + \sum_{\tau=1990}^{T=1999} \gamma_\tau \cdot \mathbb{1}_{t=\tau} \cdot Treat_i^k + X_{it} + \eta_i, \quad (1)$$

where  $CG_{it}$  measures inflation-adjusted capital gains in dollars for individual  $i$  in year  $t$ ,  $Treat_i^k$  is an indicator variable for treated individuals,  $\delta_t$  are year fixed effects,  $X_{it}$  are individual controls (gender, age, age squared, family type, number of children, postal code fixed effects). We implement specification (1) both with and without individuals fixed effects  $\eta_i$ , as well as with and without overall income level controls.<sup>18</sup> For unconditional estimates, we add \$1 to all capital gain reports.<sup>19</sup>

Extensive margin responses are estimated using an equivalent linear proba-

---

<sup>18</sup> Naturally, a specification with individual fixed effects absorbs term  $Treat_i$  and any time-invariant controls  $X_i$ .

<sup>19</sup> Estimates for the case where the dependent variable is in levels are qualitatively similar and are available in Appendix Figure D.8.

bility model (LPM) specification:

$$Positive\_CG_{it} = \alpha + \beta \cdot Treat_i^k + \delta_t + \sum_{\tau=1990}^{T=1999} \gamma_{\tau} \cdot \mathbb{1}_{t=\tau} \cdot Treat_i^k + X_{it} + \eta_i, \quad (2)$$

where  $Positive\_CG_{it}$  is an indicator of positive net capital gains. Our estimates of  $\gamma_{\tau}$  in both equations (1) and (2) are unbiased if the counterfactual capital gains realizations of tax filers in the treated groups would have followed the path of the realizations of those in the control group after the elimination of the LCGE in 1994 (i.e. parallel trends).

## 4.2 Results

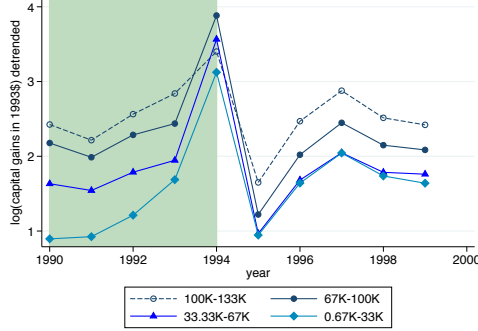
We start by evaluating the quality of our proxy for lifetime capital gains. Figure 4(a) plots the residualized capital gains by year, separately for those with different values of  $Proxy_i$ . The figure is constructed by first regressing the logarithm of capital gains on the demographic variables (gender, age, age squared, family type, number of children, postal code fixed effects), saving the residuals and then adding the unconditional sample mean of the dependent variable to the residuals. Figures 4(b) and (c) are constructed similarly for the cases when the dependent variable is the logarithm of capital gains among positive contributors and an indicator variable for positive capital gains, respectively.

Figure 4 confirms that, on average, individuals with higher values of  $Proxy_i$  exhibit higher levels of reported net capital gains and higher frequencies of reporting positive capital gains. Thus Figure 4 suggests that our proxy for lifetime capital gains correctly ranks individuals. Furthermore, while we see a pronounced spike in the amount of capital gains for treated individuals (i.e. individuals with  $Proxy_i$  of less than \$100,000) in 1994, the observed spike is much smaller for those in the control group. This confirms that untreated individuals have exhausted their exemption space and therefore have no tax-related incentive to report large capital gains in 1994.

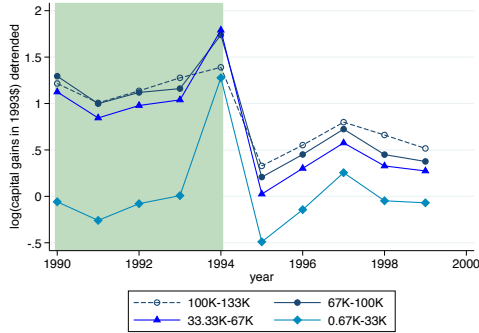
Figure 4 also allows us to evaluate pre-trends. The pre-1994 trends appear to be similar for individuals with higher levels of capital gains. However, for the  $Proxy_i \in [\$667 - \$33,334]$  group, the pre-1994 realizations appear to be growing

Figure 4: Responses by Capital Gains Levels in 1982-1993

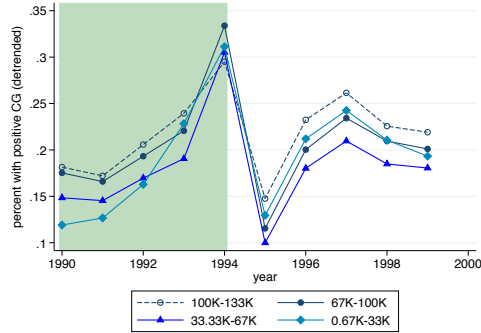
(a) Unconditional



(b) Conditional Positive



(c) Percent with Positive

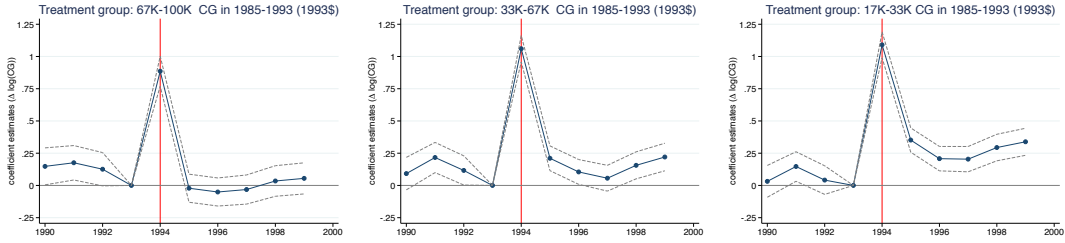


Notes: This figure plots (a) average capital gains in logs for all individuals, (b) only for individuals with positive capital gains, (c) percent of individuals who report positive net capital gains in a given year. All broken down by the amount of cumulative net capital gains reported over 1985-1993 period, measures in 1993 dollars.

more quickly than the control group. For this reason, most of our analysis below restricts this group to those whose values of  $Proxy_i \in [16, 667 - \$33, 334)$ . Finally, Figure 4(b) suggests that a step decrease reported capital gains (among positive realizers) observed in Figure 2 after 1994 is likely to be driven by compositional changes in the sample of positive realizers: all treatment groups as well as the control group exhibit a large drop in realizations after 1994.

The  $\gamma_\tau$  estimates (and the resulting standard errors) from specifications (1) and (2) are presented in Figures 5-7. The coefficients presented are based on empirical models that do not include the individual fixed effects and do not control for individuals' total income. Although our results are similar with indi-

Figure 5: Unconditional Changes in Capital Gains Realizations



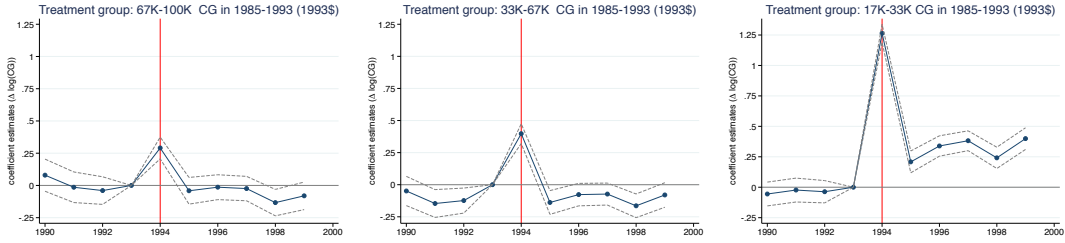
*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: 289,735; 525,650; 596,595.

vidual fixed effects and controls for income, we exclude the former in our baseline model because capital gains realizations are infrequent which may lead to noisy estimates, especially in specifications in which we restrict the sample to positive realizers. We exclude the income controls from our baseline specifications because measures of broad or total income and taxable income depend on reported realized capital gains. Thus, including these variables would introduce a (mechanical) correlation with the dependent variable. Nevertheless, Appendix Figures D.9 and D.10 report the results from models that include the individual fixed effects and income controls, respectively.

Figure 5 presents estimates of the total effects of the reform using a log specification that assumes that individuals with zero reported capital gains reported \$1 of capital gains instead. The results show a large increase in capital gains realizations in 1994. Relative to the control group, treated individuals' capital gains increased approximately twofold in 1994, with somewhat larger increases among individuals with lower values of 1985-1993 capital gains. The large realizations in 1994 are consistent with the previous literature's findings: since capital gains realizations can be easily manipulated, re-timing responses are usually strong. In the case of the studied change, re-timing responses should be particularly large since the reform did not require individuals to actually liquidate their portfolio. Instead, they could take advantage of the expiring exemption by filling out a form.

Importantly, Figure 5 suggests that the cancellation of capital gains exemption did not result in a large drop in reported capital gains in the medium-to-long

Figure 6: Intensive Margin: Changes in Positive Capital Gains Realizations



*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (1) described in Section 4.1 on the sample of observations with positive capital gains only. Number of observations: 105,105; 171,335; 186,125.

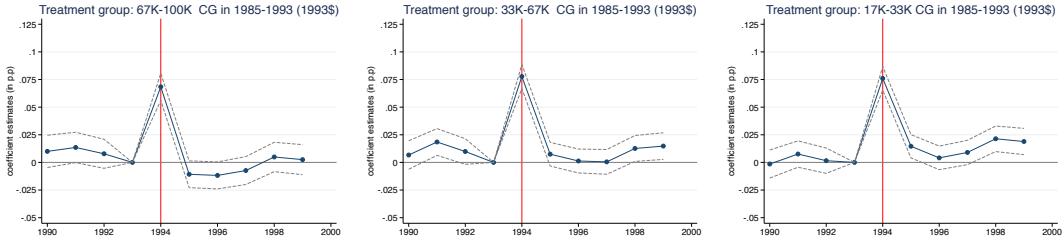
run, instead we see a statistically insignificant and close to null effect for individuals with  $Proxy_i$  of \$66,667–\$100,000 and a small increase – around 25% – for individuals with  $Proxy_i$  of \$16,667–\$33,333. The lack of response could be due to offsetting income and substitution effects, or due to the fact that capital gains are not very elastic in the medium-to-long run.

To make sure that the total effect does not mask differential impacts along the intensive and extensive margins, Figures 6 and 7 break down the total effect into intensive and extensive margin responses, thus focusing on positive capital gains realizations and on the probability of reporting positive capital gains in a given year. The pattern is similar: we see large increases in the probability of reporting positive capital gains and in the amount of reported positive capital gains in 1994. However, we see no decreases in capital gains realizations in the long-run, neither at the extensive nor intensive margins. Instead we observe an approximately null effect along the extensive margin, and a null or 25% increase along the intensive margin. This latter finding is in contrast to the time-series analysis of Figure 2(a) which implied a nontrivial negative intensive margin response. Our results thus highlight the importance of controlling for unrelated factors to measure causal effects of tax reforms and underscore the fragility of time-series analysis.

### 4.3 Robustness Checks and Heterogeneity Analysis

In this section we discuss the possibility that our estimates may be biased downward due to misclassification of control individuals, due to re-timing responses,

Figure 7: Extensive Margin: Changes in Probability of Realizations



*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (2) described in Section 4.1. Number of observations: 289,735; 525,650; 596,595

and due to mean-reversion. We then investigate how responses varied with individuals' demographic characteristics.

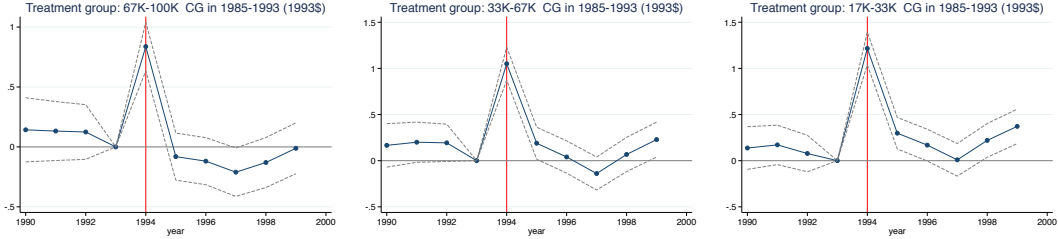
Our primary concern is a possibility that some control individuals are misclassified as treated. As discussed in Section 4.1, this may happen because we cannot observe individuals' outstanding stock of unrealized capital gains, which may be significantly larger than their observed realized gains. Furthermore, some individuals may not respond to the exemption cancellation even if they have a small stock of capital gains but they are uncertain about their future capital gains, thus a-priori behaving as if they would eventually exceed the exemption amount. The inclusion of such individuals in the treatment group would bias our results towards zero.

We provide two tests against this concern. First, the possibility of misclassification should decrease as we focus on individuals with lower levels of 1985-1993 capital gains. An important limitation to this approach is the fact that individuals with very low levels of 1985-1993 capital gains are likely to be different from individuals with high level of capital gains. However, as we can see in Figures 5 – 7, we observe a small increase in capital gains realizations for individuals with small-to-medium levels of 1985-1993 gains. In contrast to individuals with capitals gains of \$66,667-\$100,000, these individuals realize approximately 25% higher capital gains after exemption cancellation. The entire effect is driven by intensive margin responses: we see no change in the frequency of realization, but the realized amounts increase.

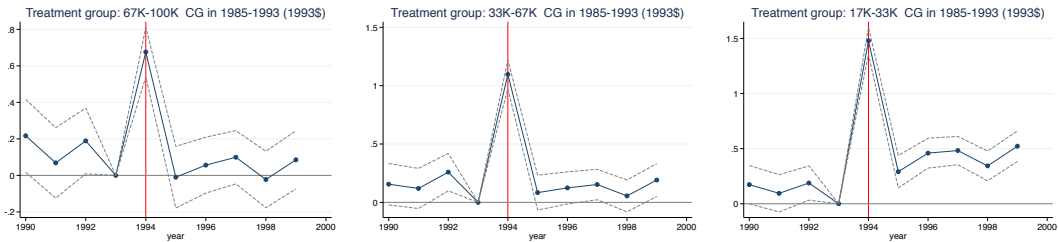
Second, the uncertainty over one's future lifetime capital gains should de-

Figure 8: Capital Gains Realizations of 65+ Year Olds

Panel A: Unconditional Capital Gains



Panel B: Intensive Margin: Positive Capital Gains



*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (1) described in Section 4.1 on the sample of 65+ year olds. Estimates for younger individuals are available in Appendix Figure D.11. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

crease with individual’s age. Therefore, individuals aged 65 or older should have a better idea of their lifetime capital gains than younger individuals. Figure 8 estimates responses of this group of individuals; estimates for other ages are shown in Appendix Figure D.11. The results are similar to the results of Figures 5 – 6, and show no response to the cancellation of capital gains exemption for individuals with 1985-1993 capital gains of more than \$33,334 and a 50% increase for individuals with pre-reform realizations between \$16,667 and \$33,334.

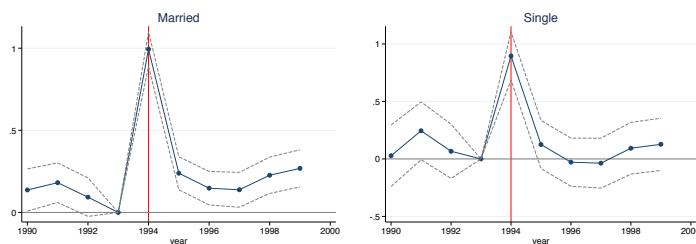
Our second concern is that because capital gains were brought forward to 1994, we may observe decreased reports of capital gains in subsequent years. Since control group individuals have already exhausted their exemption space and therefore were unable to re-time, only treated individuals have an incentive to re-time. In this case, our estimates for years 1995-1999 may be biased downward. The evidence from Figures 5-8, however, does not provide much support for such re-timing responses. While we observe large bunching in 1994, we do not see a dip in reported capital gains immediately after. Instead, capital gains realizations appear to be fairly similar throughout 1995-1999. Therefore, either re-timing led



to long-term consequences and individuals reduced realizations throughout these five years, or 1994 excess realizations did not lead to reductions in future realizations. If our estimates are indeed downward biased, then the observed null result implies that either capital gains are highly inelastic and the substitution effect from capital gains taxation is small, or that the substitution effect is dominated by the income effect.

Figure 9: Heterogeneity by Married/Single

Panel A: Unconditional Capital Gains



Panel B: Intensive Margin: Positive Capital Gains



*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specifications (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d).

Finally, our third concern is that capital gains are likely to be mean-reverting. Mean reversion could be particularly problematic in our setting since our treatment and control groups are defined based on the amount of past capital gains realizations. To alleviate this concern, we define our treatment and control groups based on capital gains in 1985-1993, i.e. over a nine year period. Since mean-reversion is most concerning over short time horizons, our approach should ensure that our results are not driven by mean-reversion. The results in Figures 5 – 7 support our approach: they show no significant pre-trends for any of the treatment groups, suggesting that mean-reversion is unlikely to drive our results. For mean-reversion to explain the increase in capital gains realization increases, the

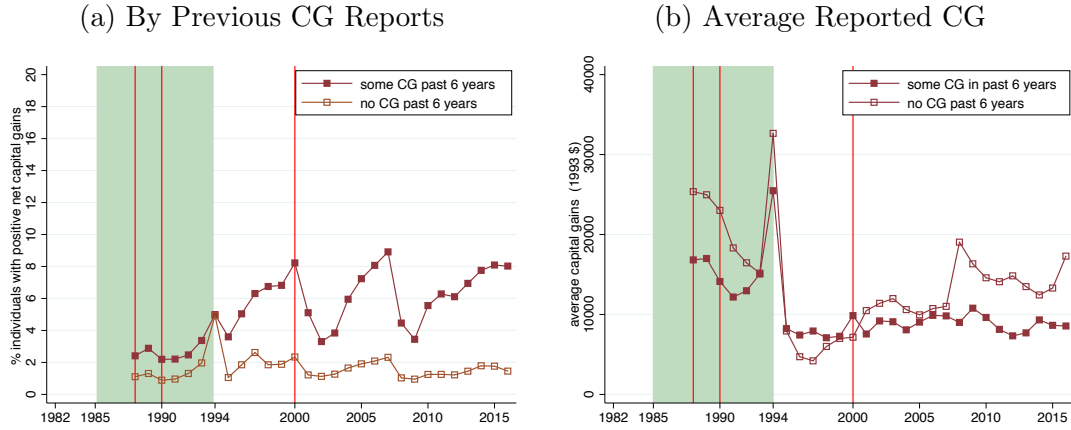
reversion towards the mean should happen precisely in 1994, which is unlikely.

Figure 9 investigates how capital gains responses vary by marital status. In Canada, income is taxed at the individual level. Since capital income can be easily held by either of the spouses, capital gains realizations could, in principle, be easily manipulated. Appendix C.3 provides time-series analysis as well as some evidence of manipulation. Figure 9 shows similar levels of re-timing responses for single and married individuals: average capital gains increased slightly more for married than for single individuals in 1994, but the amount reported increased by a larger percent for single individuals. This is consistent with the increased ability of married individuals to re-time through both the extensive and intensive margins. Medium-to-long run effects appear to be similar, especially once controlled for individuals' levels of capital gains (see Appendix Figure D.12).

Finally, Appendix Figure F.16 explores whether the reform led to substitution of capital gains income with other types of investment income as a result of LCGE cancellation. In principle, given that we do not estimate a large negative effect on capital gains realizations, such substitution responses are unlikely. Appendix Figure F.16 confirms this prediction. We see no changes for reported dividends. Investment income shows a change in trend around exemption's cancellation, suggesting a small increase in reported investment income after 1994 for individuals with 1985-1993 capital gains between \$16,667 and \$33,333. This increase is broadly consistent with a wealth effect: individuals increased savings across the investment spectrum. However, the evidence is only suggestive given the significant pre-trends. Finally, our results show some changes to tax-advantaged savings accounts (RRSPs) contributions, however, these changes are most likely to be driven by the freezing of the RRSP limit in 1994.

Figure 10 provides additional descriptive evidence on which individuals drove the spike in capital gains realizations in 1994. Figure 10(a) plots the fraction of tax filers that report a positive capital gain over time, separately for individuals that are "frequent" and "infrequent" realizers. Our definition of "frequent" realizers is individuals who report positive capital gains in any of the preceding 6 years (calculated on a rolling basis). Figure 10 shows that "infrequent" individuals appear to be driving the spike in 1994. Compared to "frequent" individuals, infrequent realizers experience a large increase in the likelihood of reporting pos-

Figure 10: Who Reported Capital Gains in 1994?



*Notes:* Figure (a) breaks down individuals who reported positive capital gains in a given year into two groups: those who have not reported positive capital gains in the past 6 years, and those who have reported at least once in the previous 6 years. The values of the red points sum up to the value of the blue points shown in Figure 2(a). Figure (b) plots average reported capital gains for each of two groups. The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000.

itive capital gains and report larger average gains in 1994 (Figure 10(b)). On the other hand, infrequent realizers appear to be less responsive to fluctuations in the stock market. This pattern is consistent across age groups (Appendix Figure C.3). Unfortunately, the data do not allow us to discern whether the differences in behavior between frequent and infrequent realizers is driven by differences in savings behavior, differences in the asset allocations of their portfolios or differences in the frequency of adjusting their portfolios, conditional on asset allocation. The ability to crystalize gains by filling out form T664 in 1994 made it beneficial for all investors to report capital gains in 1994.

## 5 Implied Elasticities and Interpretation of the Results

In this section we discuss our findings and convert our event study estimates into elasticities.

Earlier work estimates capital gains responses to tax rates, resulting in elas-

ticity estimates  $e$  given by  $e = \frac{\Delta \log(CG)}{\Delta \log(\tau_{CG})}$ . To calculate such elasticity, one needs to divide the estimated difference-in-differences estimates by the corresponding percent tax changes. In our setting, this approach is infeasible due to the fact that the exemption cancellation resulted in a tax increase from 0, implying  $\Delta \log(\tau_{CG}) \approx \% \Delta \tau = -\infty$ . For this reason, we calculate three types of elasticities.

First, we calculate elasticities with respect to tax rate by assuming symmetry: in other words, that the estimated responses would have been the same albeit of the opposite sign if the tax rate decreased from  $\tau_{CG}$  to zero. In this case, elasticity estimates are simply equal to difference-in-difference estimates, since a tax change from  $\tau_{CG}$  to zero is a 100% tax change, implying  $\Delta \log(\tau_{CG}) \approx 1$ . Hence,  $e_1 = \Delta \log(CG)$ . Second, we calculate elasticities with respect to net-of-tax rate, i.e.  $e_2 = \frac{\Delta \log(CG)}{\Delta \log(1-\tau_{CG})}$ . The advantage of this approach is that it makes our estimates easily comparable to estimates from the taxable income elasticity literature and to recent estimates of [Agersnap and Zidar \(2020\)](#). Finally, we estimate semi-elasticities  $e_3 = \frac{\Delta \log(CG)}{\Delta \tau_{CG}}$ , which measure percent change in capital gains with respect to a 1pp increase in capital gains taxes.

Total and intensive margin elasticities are based on estimates of  $\Delta \log(CG)$  from Figures 5 and 6. Extensive margin elasticities are estimated using the same formulae but with  $\Delta \% Positive\_CG$  in place of  $\Delta \log(CG)$ .  $\Delta \% Positive\_CG$  is calculated by dividing estimates of  $\Delta Positive\_CG$  from Figure 7 by pre-reform average  $Positive\_CG$  of 0.19, 0.16 and 0.16 respectively. Standard errors are calculated using the delta method. Note that elasticities  $e_1$  and  $e_3$  are of the opposite sign of elasticity  $e_2$ . Positive elasticities  $e_1$  and  $e_3$  (and hence a negative  $e_2$ ) imply that capital gains increase in response to capital gains tax increase, while negative values imply that capital gains decrease in response to capital gains tax increase.

Table 2 summarizes elasticities based on point estimates in 1994 (i.e. short run responses), in 1997 (i.e. medium-run responses) and in 1999 (i.e. long-run responses). Relative to the transitory elasticity estimates summarized in [Stantcheva \(2020\)](#) that range between -1.1 to -6.4, our estimates of short-run responses are at the lower end of the spectrum and range between -0.89 to -1.09. Our short-term elasticities with respect to net-of-tax rate range between 2.92-

Table 2: Summary of Elasticity Estimates

Average MTR		Total Response			Intensive Margin			Extensive Margin		
in 1990-1999		$e_1$	$e_2$	$e_3$	$e_1$	$e_2$	$e_3$	$e_1$	$e_2$	$e_3$
Short-run – 1994:										
67K-100K	35%	-0.89	2.92	-3.39	-0.29	0.95	-1.1	-0.36	1.18	-1.37
		(0.06)	(0.2)	(0.23)	(0.04)	(0.13)	(0.15)	(0.03)	(0.1)	(0.11)
33K-67K	34%	-1.06	3.6	-4.16	-0.4	1.36	-1.57	-0.48	1.63	-1.88
		(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)	(0.03)	(0.1)	(0.12)
17K-33K	34%	-1.09	3.7	-4.27	-1.26	4.28	-4.94	-0.48	1.63	-1.88
		(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)	(0.03)	(0.1)	(0.12)
Medium-run – 1997:										
67K-100K	35%	-0.03	0.1	-0.11	-0.02	0.07	-0.08	-0.04	0.13	-0.15
		(0.06)	(0.2)	(0.23)	(0.05)	(0.16)	(0.19)	(0.03)	(0.1)	(0.11)
33K-67K	34%	0.06	-0.2	0.24	-0.07	0.24	-0.27	0	0	0
		(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)	(0.03)	(0.1)	(0.12)
17K-33K	34%	0.2	-0.68	0.78	0.38	-1.29	1.49	0.06	-0.2	0.24
		(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)	(0.04)	(0.14)	(0.16)
Long-run – 1999:										
67K-100K	35%	0.05	-0.16	0.19	-0.08	0.26	-0.3	0.01	-0.03	0.04
		(0.06)	(0.2)	(0.23)	(0.05)	(0.16)	(0.19)	(0.04)	(0.13)	(0.15)
33K-67K	34%	0.22	-0.75	0.86	-0.08	0.27	-0.31	-0.18	0.61	-0.71
		(0.05)	(0.17)	(0.2)	(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)
17K-33K	34%	0.34	-1.16	1.33	0.4	-1.36	1.57	0.12	-0.41	0.47
		(0.05)	(0.17)	(0.2)	(0.05)	(0.17)	(0.2)	(0.04)	(0.14)	(0.16)

*Notes:* This table calculates elasticities of capital gains with respect to capital gains tax using three different formulas:  $e_1 = \Delta \log(CG)$ ,  $e_2 = \frac{\Delta \log(CG)}{\Delta \log(1-\tau_{CG})}$ , and  $e_3 = \frac{\Delta \log(CG)}{\Delta \tau_{CG}}$ . Total and intensive margin elasticities are based on estimates of  $\Delta \log(CG)$  from Figures 5 and 6. Extensive margin elasticities are estimated using the same formulae but with  $\Delta \%Positive\_CG$  in place of  $\Delta \log(CG)$ .  $\Delta \%Positive\_CG$  is calculated by dividing estimates of  $\Delta Positive\_CG$  from Figure 7 by pre-reform average  $Positive\_CG$  of 0.19, 0.16 and 0.16 respectively. Standard errors are calculated using the delta method.

3.7 and are similar to estimates of [Agersnap and Zidar \(2020\)](#) of 3.61. Finally, our long-term elasticities are either small or of the opposite sign relative to the earlier estimates of permanent elasticities, summarized in [Stantcheva \(2020\)](#) to range between 0 to -1.7.

The negative estimate of long-run elasticity of capital gains realizations with respect to the net of tax rate is consistent with the wealth effect arising from the elimination of the LCGE being relatively important. To see this, note that capital gains tax increase can lead to adjustments along three margins: frequency of realizations, portfolio allocation across asset classes, and savings decisions. The first two margins imply negative income and substitution effects by forcing individuals to hold potentially sub-optimal portfolios. The third margin, however, implies a negative substitution effect and a positive wealth effect: higher capital gains taxes make savings more expensive (substitution effect) while at the same time decreasing consumption in both periods (wealth effect). Our results suggest that this wealth effect is likely to be particularly important for younger tax filers with modest prior realizations. This may not be surprising given that the elimination of the LCGE was not viewed as a transitory tax policy change ([Richardson and Moore \(1995\)](#)). Strictly speaking, this interpretation requires us to assume that those with large and small 1985-1993 realizations have similar underlying structural elasticities. If this is not the case, the observed increase in capital gains realizations after the LCGE cancellation may represent differences in underlying structural elasticities (e.g. due to different preferences or discount factors) rather than income effect responses.

## 6 Conclusion

In this paper we provide estimates of the causal effect of the 1994 cancellation of the \$100,000 LCGE in Canada on realized capital gains and other measures of saving. Comparing tax filers who did not exhaust their LCGE limit to those that did, before and after the 1994 reform, we find that the unexpected cancellation of the exemption led to an immediate spike in realized capital gains in 1994 as tax filers exhausted their remaining LCGE space. We also find that the cancellation of the LCGE increased realized capital gains in the medium and long-run for tax

filers with modest pre-reform capital gains. In contrast, we estimate that the elimination of the LCGE had no statistically significant effect on the realization behavior of tax filers with larger pre-1994 capital gains. Our results are similar, qualitatively and quantitatively, when we restrict the sample to young, middle-age and older tax filers, respectively. Moreover, our estimates are similar for tax filers that are married and those that are unattached.

Taken together, our results suggest that despite increasing the marginal effective tax rate on capital gains income for most tax filers, the elimination of the LCGE had little effect on capital gains realizations in the long run. We also find little evidence of substitution away from capital gains and towards other types of investment income, such as interest income and dividends.

One interpretation of our results is that the unexpected cancellation of the LCGE led to a large, negative wealth shock that led to increased savings in the medium and long-run. This wealth shock would have been largest for those with the most unused exemption space (i.e. those with modest pre-reform capital gains) and it is precisely this group that experienced the largest increase in realizations in the post-1994 period. While this explanation can reconcile our results, we remain cautious because it is possible that individuals with different pre-reform capital gains may have different underlying structural parameters (risk aversion, discount factors etc.) and it is these differences that are driving the heterogeneity in our estimates.

## References

- AGERSNAP, O. AND O. M. ZIDAR (2020): “The Tax Elasticity of Capital Gains and Revenue-Maximizing Rates,” Working Paper 27705, National Bureau of Economic Research.
- AUERBACH, A. J. AND J. POTERBA (1988): “Capital Gains Taxation in the United States: Realizations, Revenue, and Rhetoric,” *Brookings Papers on Economic Activity*, 1988, 595–637.
- AUERBACH, A. J. AND J. M. SIEGEL (2000): “Capital-gains realizations of the rich and sophisticated,” *American Economic Review*, 90, 276–282.
- AUTEN, G., L. E. BURMAN, AND W. C. RANDOLPH (1989): “Estimation and

- Interpretation of Capital Gains Realization Behavior: Evidence from Panel Data,” *National Tax Journal*, 42, 353–374, number: 3 Reporter: National Tax Journal Publisher: National Tax Association.
- AUTEN, G. E. AND C. T. CLOTFELTER (1982): “Permanent versus Transitory Tax Effects and the Realization of Capital Gains,” *The Quarterly Journal of Economics*, 97, 613–632.
- BAKIJA, J. AND W. M. GENTRY (2014): “Capital Gains Taxes and Realizations: Evidence from a Long Panel of State-Level Data,” Mimeo.
- BERNHEIM, B. D. (2002): “Taxation and Saving,” in *Handbook of Public Economics*, ed. by A. J. Auerbach and M. Feldstein, Elsevier, vol. 3, 1173–1249.
- BOGART, W. T. AND W. M. GENTRY (1995): “Capital Gains Taxes and Realizations: Evidence from Interstate Comparisons,” *The Review of Economics and Statistics*, 77, 267–282, number: 2 Reporter: The Review of Economics and Statistics Publisher: The MIT Press.
- BURMAN, L. E. AND W. C. RANDOLPH (1994): “Measuring Permanent Responses to Capital-Gains Tax Changes in Panel Data,” *The American Economic Review*, 84, 794–809.
- CHETTY, R., J. N. FRIEDMAN, S. LETH-PETERSEN, T. H. NIELSEN, AND T. OLSEN (2014): “Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence from Denmark,” *The Quarterly Journal of Economics*, 129, 1141–1219, publisher: Oxford Academic.
- DOWD, T., R. MCCLELLAND, AND A. MUTHITACHAROEN (2015): “New Evidence on the Tax Elasticity of Capital Gains,” *National Tax Journal*, 68, 511–544, number: 3 Reporter: National Tax Journal.
- FELDSTEIN, M., J. SLEMROD, AND S. YITZHAKI (1980): “The Effects of Taxation on the Selling of Corporate Stock and the Realization of Capital Gains,” *The Quarterly Journal of Economics*, 94, 777–791.
- GILLINGHAM, R. AND J. S. GREENLESS (1992): “The Effect of Marginal Tax Rates on Capital Gains Revenue: Another Look at the Evidence,” *National Tax Journal*, 45, 167–177, number: 2 Reporter: National Tax Journal Publisher: National Tax Association.
- GRAVELLE, J. G. (2020): “Capital Gains Tax Options: Behavioral Responses and Revenues,” CRS Report E41364, Congressional Research Service (CRS).



- LANDSMAN, W. R., D. A. SHACKELFORD, AND R. J. YETMAN (2002): “The Determinants of Capital Gains Tax Compliance: Evidence from the RJR Nabisco Leveraged Buyout,” *Journal of Public Economics*, 84, 47–74, number: 1 Reporter: Journal of Public Economics.
- LINDSEY, L. B. (1987): “Capital gains rates, realizations, and revenues,” in *The effects of taxation on capital accumulation*, University of Chicago Press, 69–100, reporter: The effects of taxation on capital accumulation.
- MANOLI, D. AND A. WEBER (2016): “Nonparametric Evidence on the Effects of Financial Incentives on Retirement Decisions,” *American Economic Journal: Economic Policy*, 8, 160–182.
- MESSACAR, D. (2018): “Crowd-Out, Education, and Employer Contributions to Workplace Pensions: Evidence from Canadian Tax Records,” *The Review of Economics and Statistics*, 100, 648–663.
- MINARIK, J. J. (1981): “Capital gains,” *How taxes affect economic behavior*, 255–65, reporter: How taxes affect economic behavior Publisher: Brookings Institution Washington, DC.
- POTERBA, J. M. (1987): “Tax Evasion and Capital Gains Taxation,” *The American Economic Review*, 77, 234–239, number: 2 Reporter: The American Economic Review Publisher: American Economic Association.
- RICHARDSON, S. R. AND K. E. MOORE (1995): “Canadian Experience with the Taxation of Capital Gains,” *Canadian Public Policy / Analyse de Politiques*, 21, S77–S99, reporter: Canadian Public Policy / Analyse de Politiques.
- SAEZ, E. AND S. STANCHEVA (2018): “A simpler theory of optimal capital taxation,” *Journal of Public Economics*, 162, 120–142.
- SLEMROD, J. AND W. SHOBE (1990): “The Tax Elasticity of Capital Gains Realizations: Evidence from a Panel of Taxpayers,” NBER Working Paper 3237.
- STANCHEVA, S. (2020): “Dynamic Taxation,” NBER Working Paper 26704, series: Working Paper Series.

# APPENDIX FOR ONLINE PUBLICATION

## A Tax Rules and Tax Rates

Table A.1: Summary of Tax Rules and Rates

Year	Capital Gains:			Income Tax:				
	Inclusion Rate	Lifetime Exemptions:		# of Tax Brackets	Federal Top MTR:		Provincial Top MTRs:	
		General	Small Business		Top MTR Cutoff	Top MTR	Range	Median
2002	0.5	0	500,000	4	103,000	29	10 - 30	17
2003	0.5	0	500,000	4	104,648	29	10 - 30	17
2004	0.5	0	500,000	4	113,804	29	10 - 30	17
2005	0.5	0	500,000	4	115,739	29	10 - 30	17
2006	0.5	0	500,000	4	118,285	29	10 - 30	17
2007	0.5	0	500,000	4	120,887	29	10 - 28	17
2008	0.5	0	500,000	4	123,184	29	10 - 26	17
2009	0.5	0	500,000	4	126,264	29	10 - 26	17
2010	0.5	0	500,000	4	127,021	29	10 - 25	16
2011	0.5	0	500,000	4	128,800	29	10 - 25	15
2012	0.5	0	500,000	4	132,406	29	10 - 25	15
2013	0.5	0	500,000	4	135,054	29	10 - 27	16
2014	0.5	0	500,000	4	136,270	29	10 - 25	17
2015	0.5	0	500,000	4	138,586	29	10 - 25	17

*Notes:* This table summarize tax rules for capital gains and income tax rates.

Table A.2: Dividend Tax Rules and RRSP Rules

Year	Dividend Taxes:		RRSP:	
	Gross Up	Tax Credit	Maximum Contribution:	
	Factor	Rate	Amount	Rate
1982	0.5	0.227	5,500	0.2
1983	0.5	0.227	5,500	0.2
1984	0.5	0.227	5,500	0.2
1985	0.5	0.227	5,500	0.2
1986	0.5	0.227	7,500	0.2
1987	0.333	0.167	7,500	0.2
1988	0.25	0.133	7,500	0.2
1989	0.25	0.133	7,500	0.2
1990	0.25	0.133	7,500	0.2
1991	0.25	0.133	11,500	0.18
1992	0.25	0.133	12,500	0.18
1993	0.25	0.133	12,500	0.18
1994	0.25	0.133	13,500	0.18
1995	0.25	0.133	14,500	0.18
1996	0.25	0.133	13,500	0.18
1997	0.25	0.133	13,500	0.18
1998	0.25	0.133	13,500	0.18
1999	0.25	0.133	13,500	0.18
2000	0.25	0.133	13,500	0.18
2001	0.25	0.133	13,500	0.18

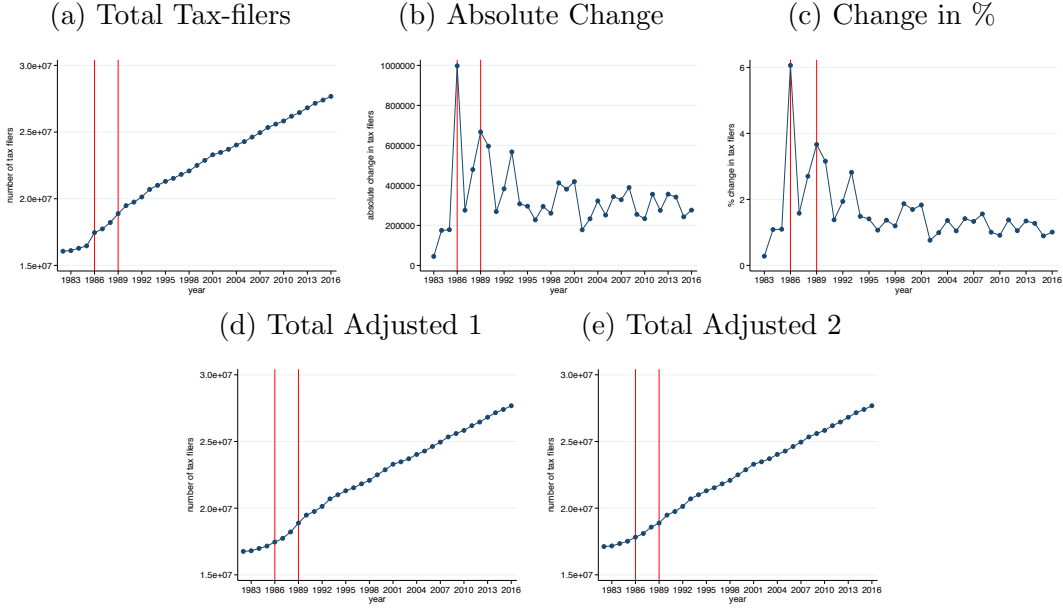
*Notes:* This table summarized taxation rules of dividends and contribution rules for Registered Retirement Savings Plans (RRSPs).

## B Changes in Propensities to File a Tax Return

As described in Section 2, the Longitudinal Administrative Databank represents a 20% random sample of Canadian taxpayers. Two policy changes could have sizable effects on the tax filing decisions of Canadians: the introduction of the Federal sales tax credit in 1986 and the Goods and Services Tax credit in 1989. Both changes made tax filing attractive to low-income individuals by allowing them to claim refundable tax credits. To evaluate the importance of these changes, we plot the number of tax-filers in the data in Figure B.1(a). The vertical red lines identify years 1986 and 1989. As expected, we see small jumps in the number of taxpayers, which can be better seen in Figure B.1(b) which shows the absolute change in the number of tax-filers from previous year. Figure B.1(c) plots the same changes but in percent. Figures B.1(b)-(c) confirm that there are dispro-

portionately large increases in the number of tax-filers in 1986 and 1989, however, these increases are not very large. Overall, changes in tax-filing behavior are very small and are unlikely to have any effect on the results of Section 4, that uses microdata.

Figure B.1: Changes in the Number of Tax Filers Over Time



*Notes:* This table shows the raw number of tax-filers in the data, as well as the adjusted totals using the procedure described above.

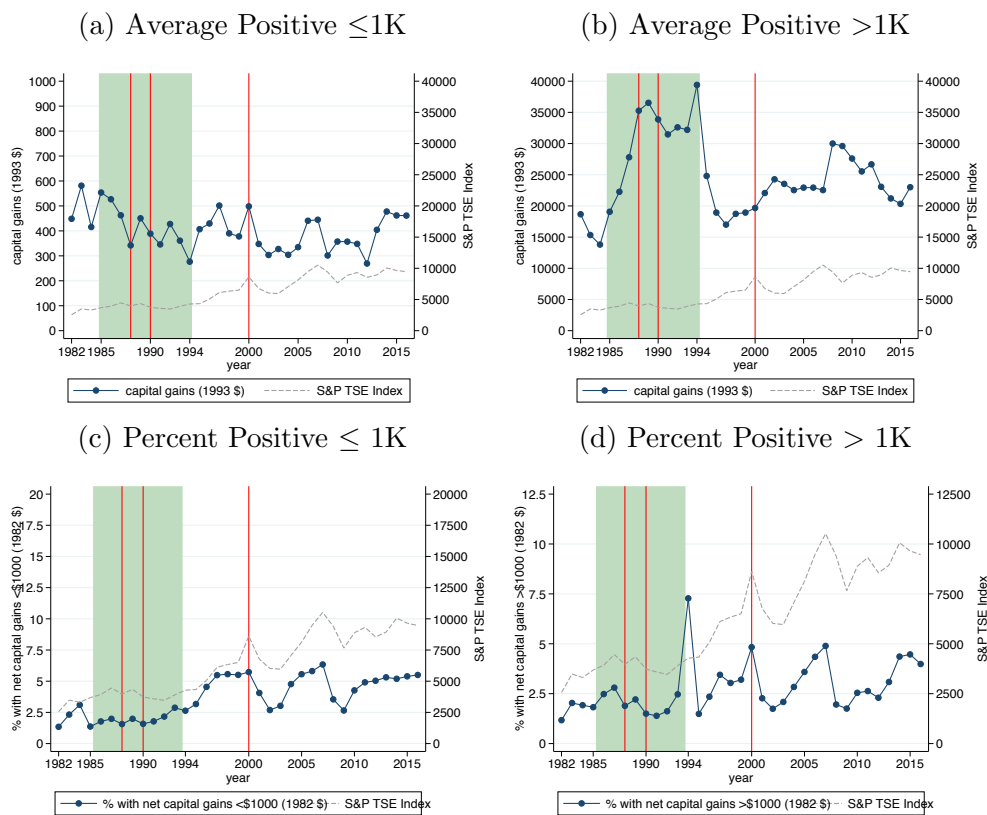
However, the changes will have a small effect on the shares of individuals who report positive capital gains shown in Figure 2(a). To improve the comparability of these shares over time, we perform the following adjustment. we calculate average yearly increase in the number of tax filers between 1994 and 2016. Let  $N_t$  measures the number of tax-filers in the data in year  $t$ , then the average increase is given by  $\bar{N}_{1994-2016} = \frac{1}{23} \sum_{t=1995}^{2016} (N_t - N_{t-1})$ . Then we re-calculate pre-1986 totals as  $N_t^{adjusted} = N_t^{observed} + (N_{1986} - N_{1985} - \bar{N}_{1994-2016})$ . The first adjustment results in Figures B.1(d). Then we repeat the adjustment again to account for 1989 change, i.e. we re-calculate pre-1986 totals as  $N_t^{adjusted} + (N_{1989} - N_{1988} - \bar{N}_{1994-2016})$ , and 1987-1988 totals as  $N_t^{observed} + (N_{1989} - N_{1988} - \bar{N}_{1994-2016})$ . The second and final adjustment are shown in Figures B.1(e). The two procedures effective inflate the pre-1989 totals by the magnitude of the “excess” jumps in

1986 and 1989. The totals shown in Figures B.1(e) are used to calculate shares shown in Figure 2.

## C Additional Time Series Evidence

### C.1 Small vs Large Realizations

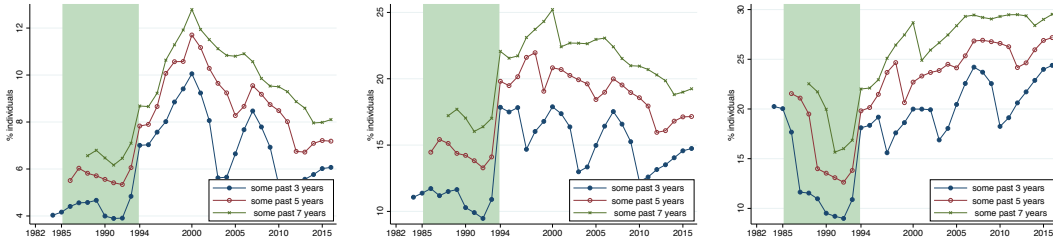
Figure C.2: Capital Gains Over Time – Small vs Large Capital Gains



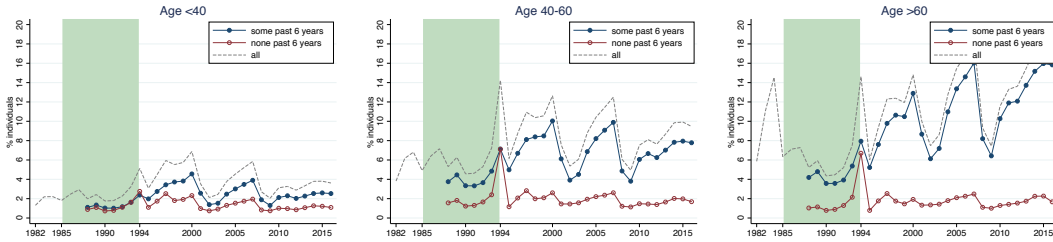
*Notes:* The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000. The dashed grey line shows the inflation-adjusted values of the Standard and Poor's Toronto Stock Exchange Composite Index.

Figure C.3: Capital Gains Realizations by Previous 6 years: By Age

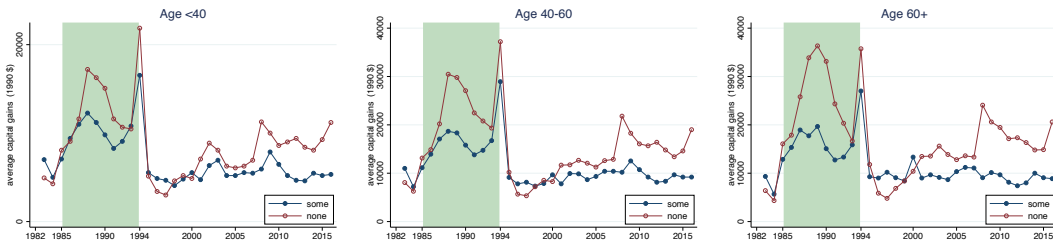
(a) Percent with CG in past 3, 5, 7 years (b) Percent with CG in past 3, 5, 7 years (c) Percent with CG in past 3, 5, 7 years



(d) Percent with some or no CG in Past 6 years (e) Percent with some or no CG in Past 6 years (f) Percent with some or no CG in Past 6 years



(g) Percent with some or no CG in Past 6 years (h) Percent with some or no CG in Past 6 years (i) Percent with some or no CG in Past 6 years

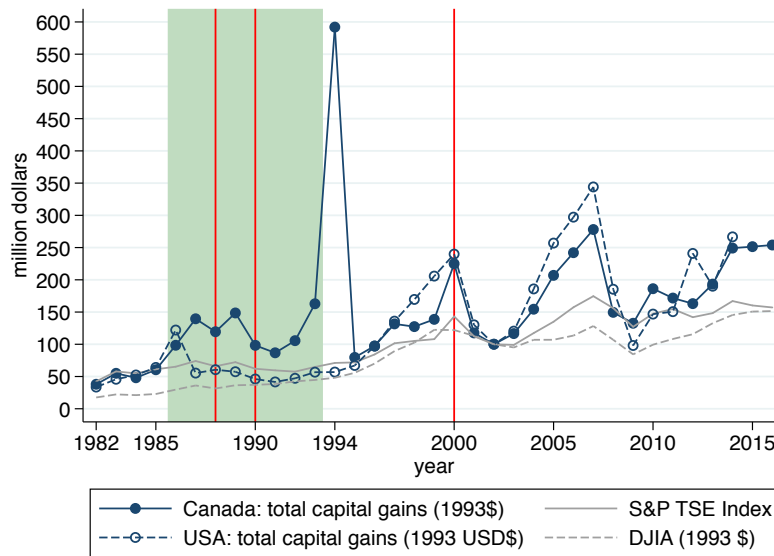


Notes: The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000.

## C.2 Comparison with the U.S.

Figures C.4 and C.5 compare capital gains realizations in the U.S. and Canada. Figure C.4 compares total reported capital gains in Canada based on the LAD dataset (i.e. totals scaled from a 20% random LAD sample), with the totals from the U.S. Department of the Treasury report.

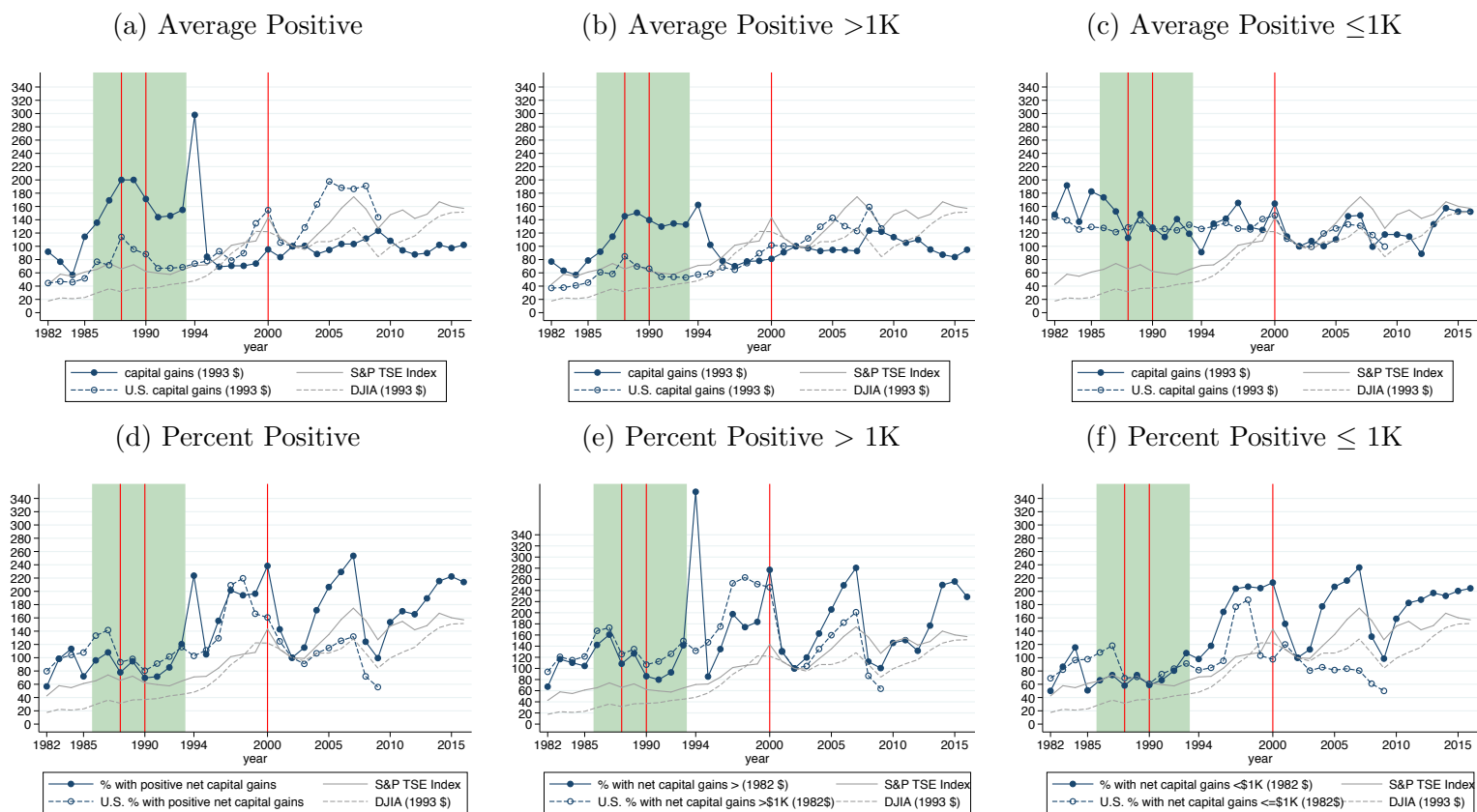
Figure C.4: Total Reported Capital Gains Over Time – Comparison with the U.S. Series



*Notes:* This figure shows total reported capital gains in million dollars in the U.S. and Canada. The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000. The dashed grey line shows the inflation-adjusted values of the Standard and Poor's Toronto Stock Exchange Composite Index. In figures (c) and (d), the line shown is fitted to the years when there was no exemption, i.e. excluding years 1985-1994, which are highlighted in green.

Figure C.5 uses annual cross-sections of individual tax returns constructed by the Internal Revenue Service (IRS) and commonly known as the Statistics of Income (SOI) Public Use Files, for years 1982–2009, which consist of stratified random samples of approximately 80,000-200,000 tax returns per year.

Figure C.5: Capital Gains Over Time – Comparison with the U.S. Series



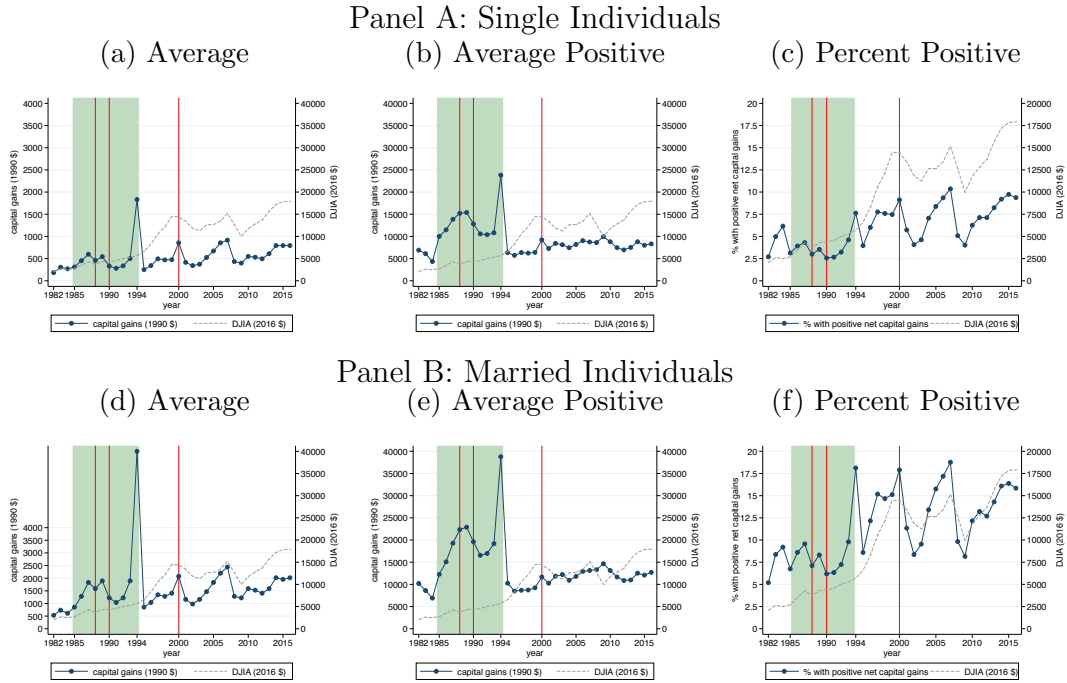
*Notes:* The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000. The dashed grey line shows the inflation-adjusted values of the Standard and Poor's Toronto Stock Exchange Composite Index. In figures (c) and (d), the line shown is fitted to the years when there was no exemption, i.e. excluding years 1985-1994, which are highlighted in green.



### C.3 Spousal Responses

Figure C.6 repeat Figures 1-2 but break down individuals by partner status. All results from Section 3 appear to carry over.

Figure C.6: Intensive Margin Responses by Singles and Couples



*Notes:* The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and to 75% in 1988 and 1990, respectively; and a decrease from 75% to 50% in 2000.

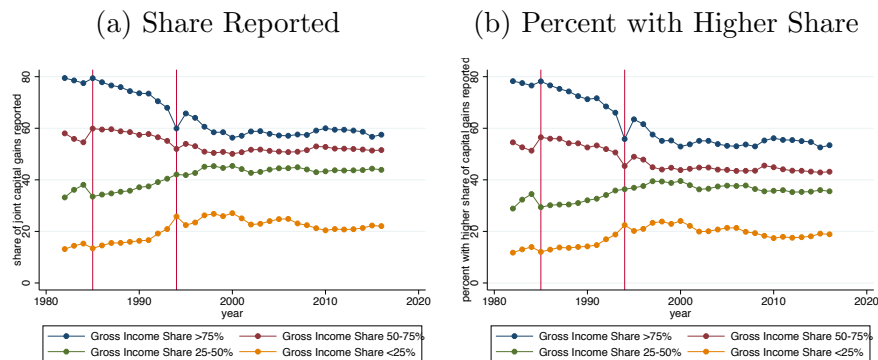
Because Canada taxes spouses and common-law partners individually, partners have an incentive to split income evenly if possible.<sup>20</sup> Since wage income cannot be split but capital gains can be tentatively allocated to a lower earning spouse, couples with uneven incomes are incentivized to shift all capital income to the lower-wage spouse. This strategy remains advantageous during the exemption period, however, couples with large capital gains may want to take advantage of the exemption by attributing some capital gains to the high-earning spouse in order to take advantage of his/hers exemption. Therefore, these avoidance

<sup>20</sup> There are some small deviations from this rule, e.g. some credits depend on joint income and the personal exemption amount is partially sharable.

strategy may result in positive capital gains reports by the spouse who previously have not reported capital gains. For couples where partners earn similar incomes, the optimal tax strategy is to split assets and the resulting capital gains equally. Capital gains exemption does not change this incentive and therefore should not result in a change of behavior. To summarize, the ability to shift capital gains between partners should result in an upward bias of the extensive margin estimates, thus providing further support that the lifetime exemption did not increase participation in the capital markets.

Figure C.7 explores whether couples follow these optimal strategies. The results suggest a firm “no”: for the vast majority of couples, individual who earns the most gross income also reports the most capital gains income. In fact, for the majority of couples, capital gains are reported on one of the returns only and typically this is the tax return of a higher-earning partner. Nonetheless, Figure C.7 also documents that from 1982 until approximately 2000, couples in Canada became increasingly aware of tax incentives. The introduction of the lifetime exemption – consistently with the discussion above – slowed down this convergence process.

Figure C.7: Split of Capital Gains within Couples by Shares of Gross Income

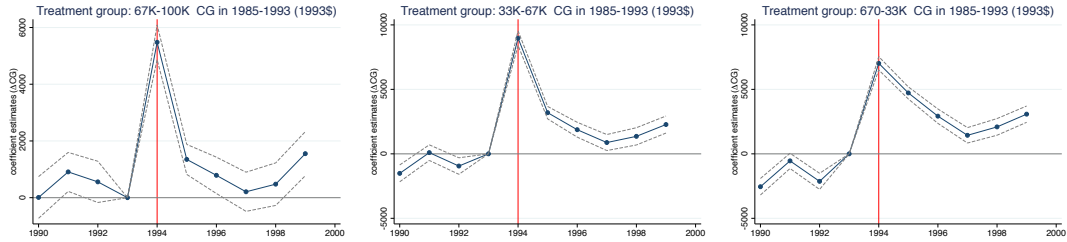


*Notes:* In this figure all individuals who are married or are in a common-law relationship, and who jointly report positive capital gains are broken down into 4 groups by sampled individual’s share of gross income. Figure (a) then shows what percent of capital gains the sampled individual report, while figure (b) shows the percent of individuals who report a greater share of capital gains income than their spouse. The green shaded area marks the period of capital gains exemption, 1985-1994. The red vertical lines mark capital gains inclusion rate changes: increase from 50% to 66.6% and further to 75% in 1988 and 1990; and a decrease from 75% to 50% in 2000.

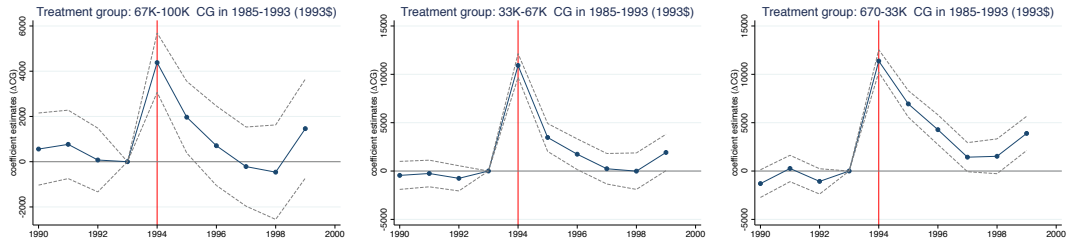
## D Additional Robustness Checks

Figure D.8: Main Results: Estimates in Levels (Not Logs)

Panel A: Unconditional Capital Gains



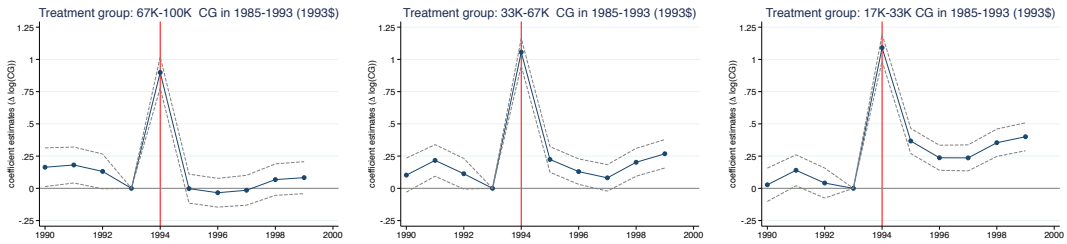
Panel B: Intensive Margin: Positive Capital Gains



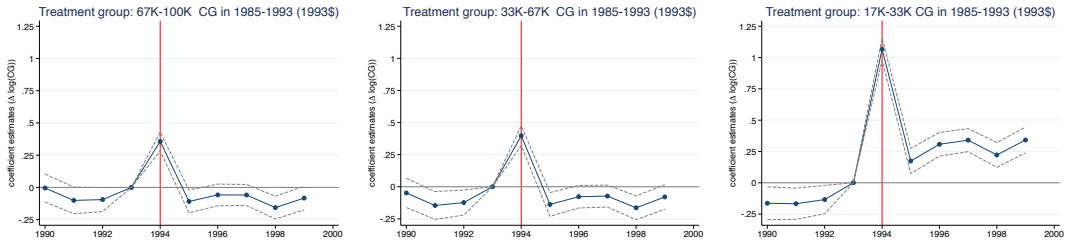
*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

Figure D.9: Main Results: Adding Individual Fixed Effects

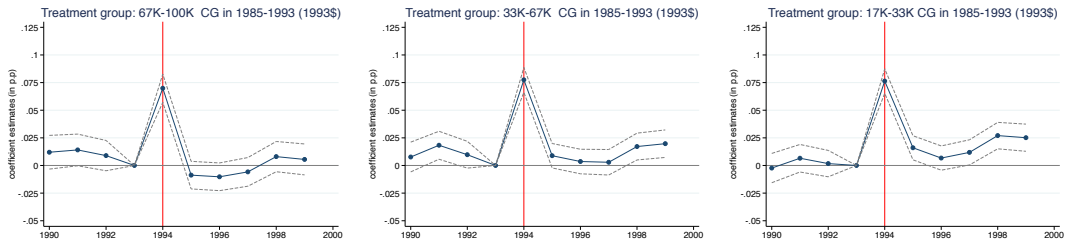
Panel A: Unconditional Capital Gains



Panel B: Intensive Margin: Positive Capital Gains



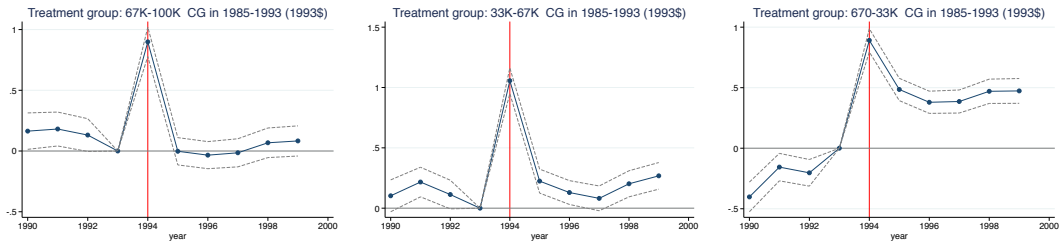
Panel C: Extensive Margin: Percent with Positive Capital Gains



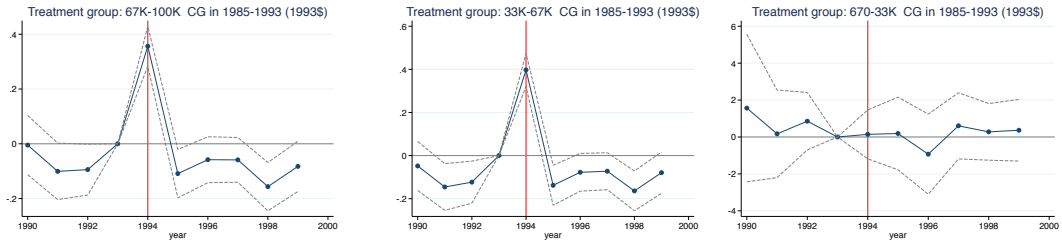
*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specifications (1) and (2) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

Figure D.10: Main Results: Adding Income Controls

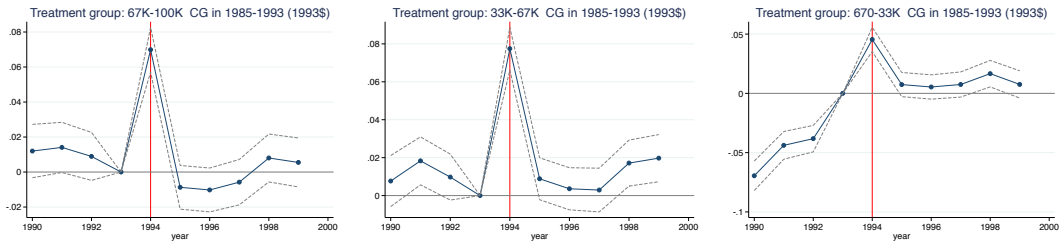
Panel A: Unconditional Capital Gains



Panel B: Intensive Margin: Positive Capital Gains



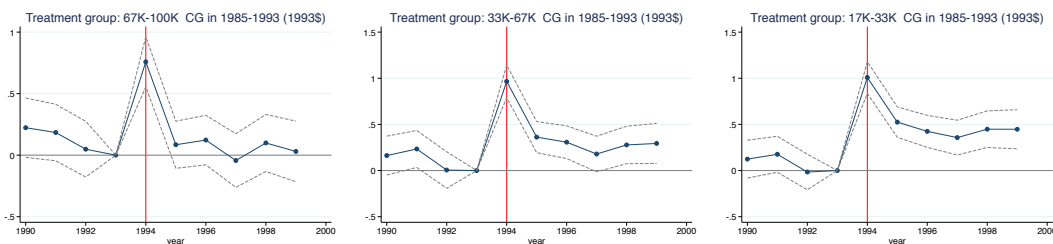
Panel C: Extensive Margin: Percent with Positive Capital Gains



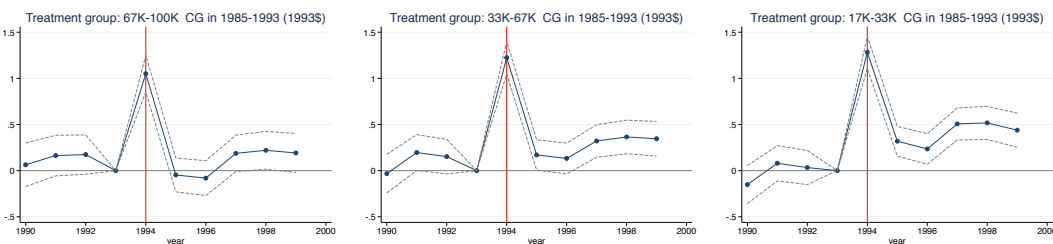
Notes: Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specifications (1) and (2) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

Figure D.11: Heterogeneity by Age

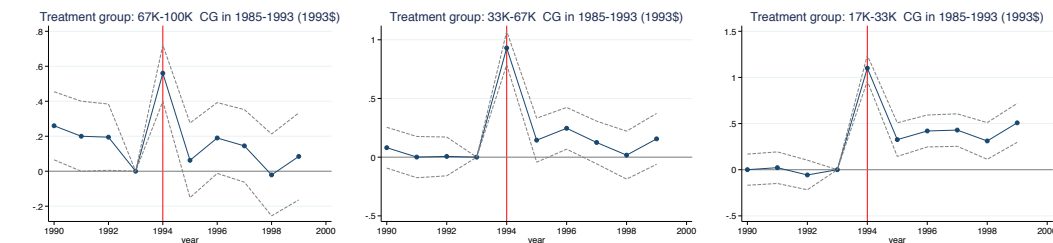
Panel A: Total Response – Age < 50



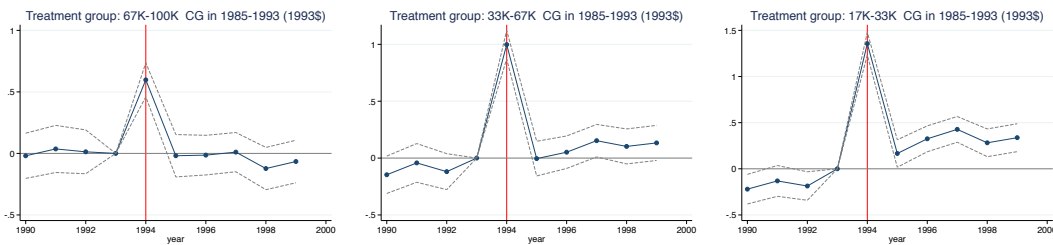
Panel B: Total Response –  $50 \leq$  Age < 65



Panel C: Intensive Margin Response – Age < 50



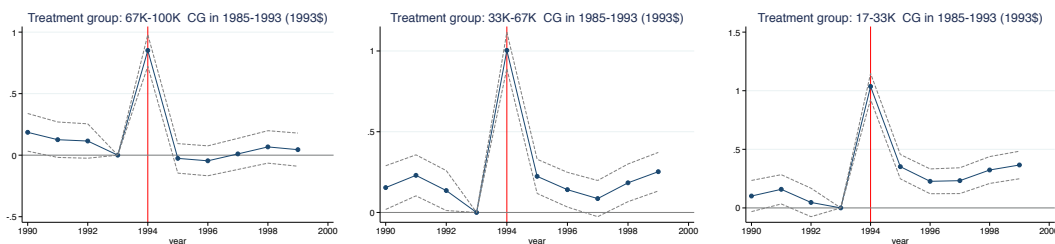
Panel D: Intensive Margin Response –  $50 \leq$  Age < 65



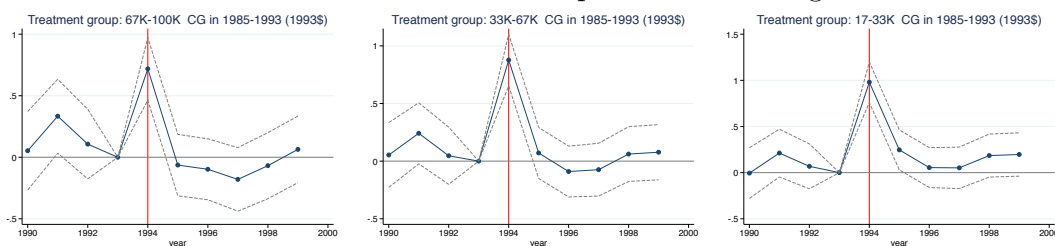
*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

Figure D.12: Heterogeneity by Marital Status

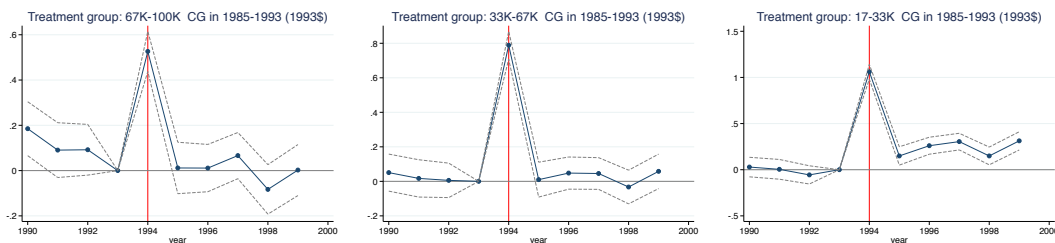
Panel A: Unconditional Capital Gains – Married



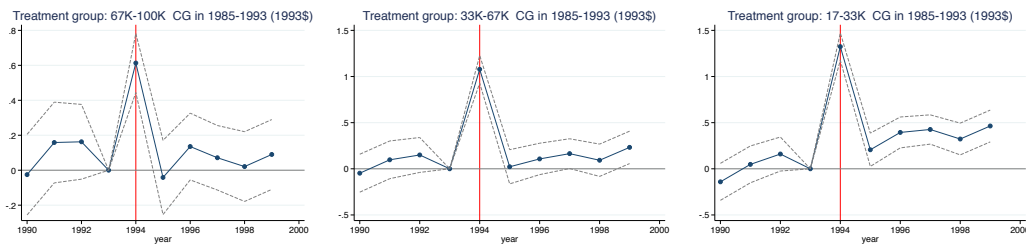
Panel B: Unconditional Capital Gains – Single



Panel C: Intensive Margin – Married



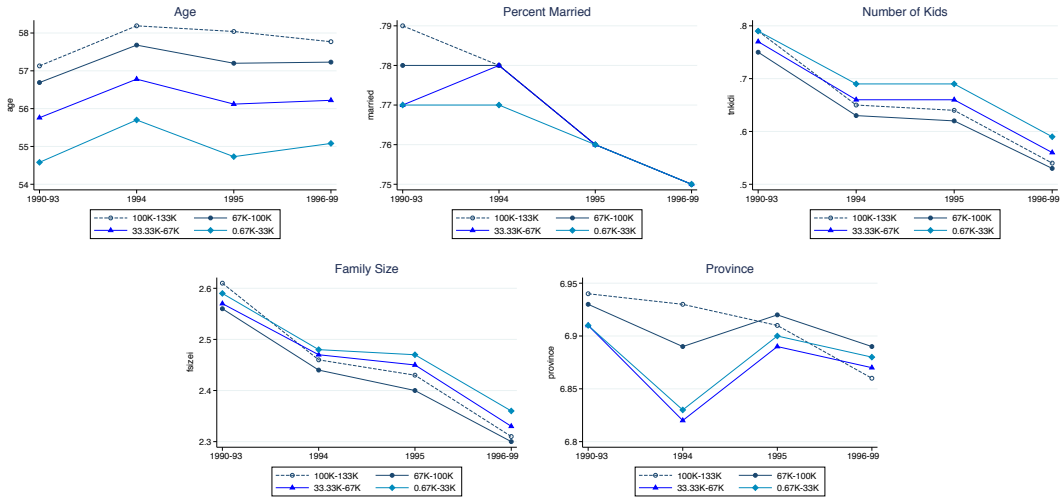
Panel D: Intensive Margin – Single



*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

# E Demographic Changes

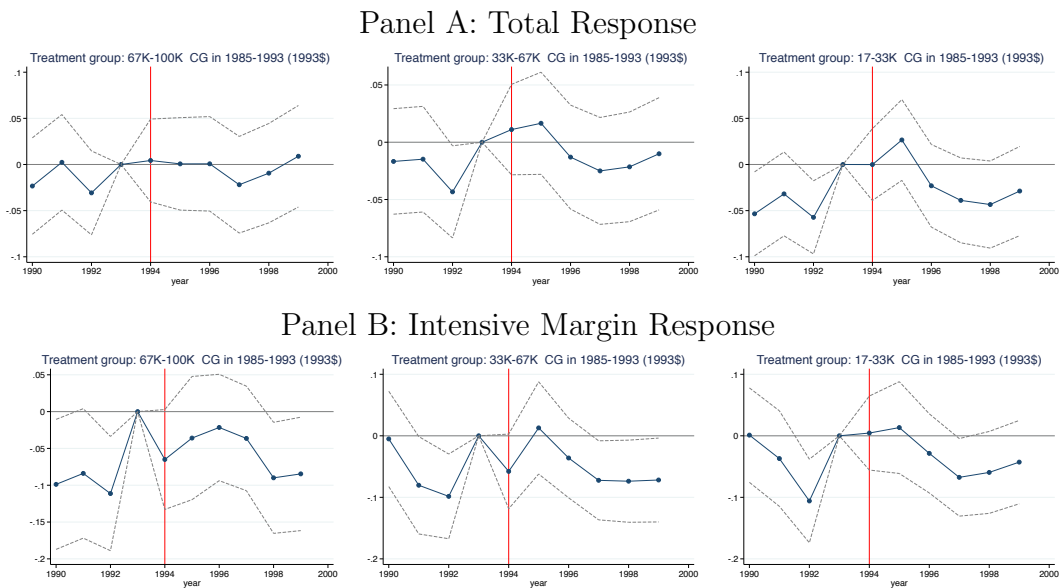
Figure E.13: Demographic Changes



*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .



Figure E.14: Taxable Income Responses



*Notes:* Each figure plots the estimates of coefficients  $\gamma_t$  from estimating specification (1) described in Section 4.1 on the full sample. All capital gains realizations are increased by \$1 to allow for zero values. Number of observations: (a), (b), (c), (d) .

## **F Substitution Effects**

Figure F.15: Dividends, Investment Income and RRSP

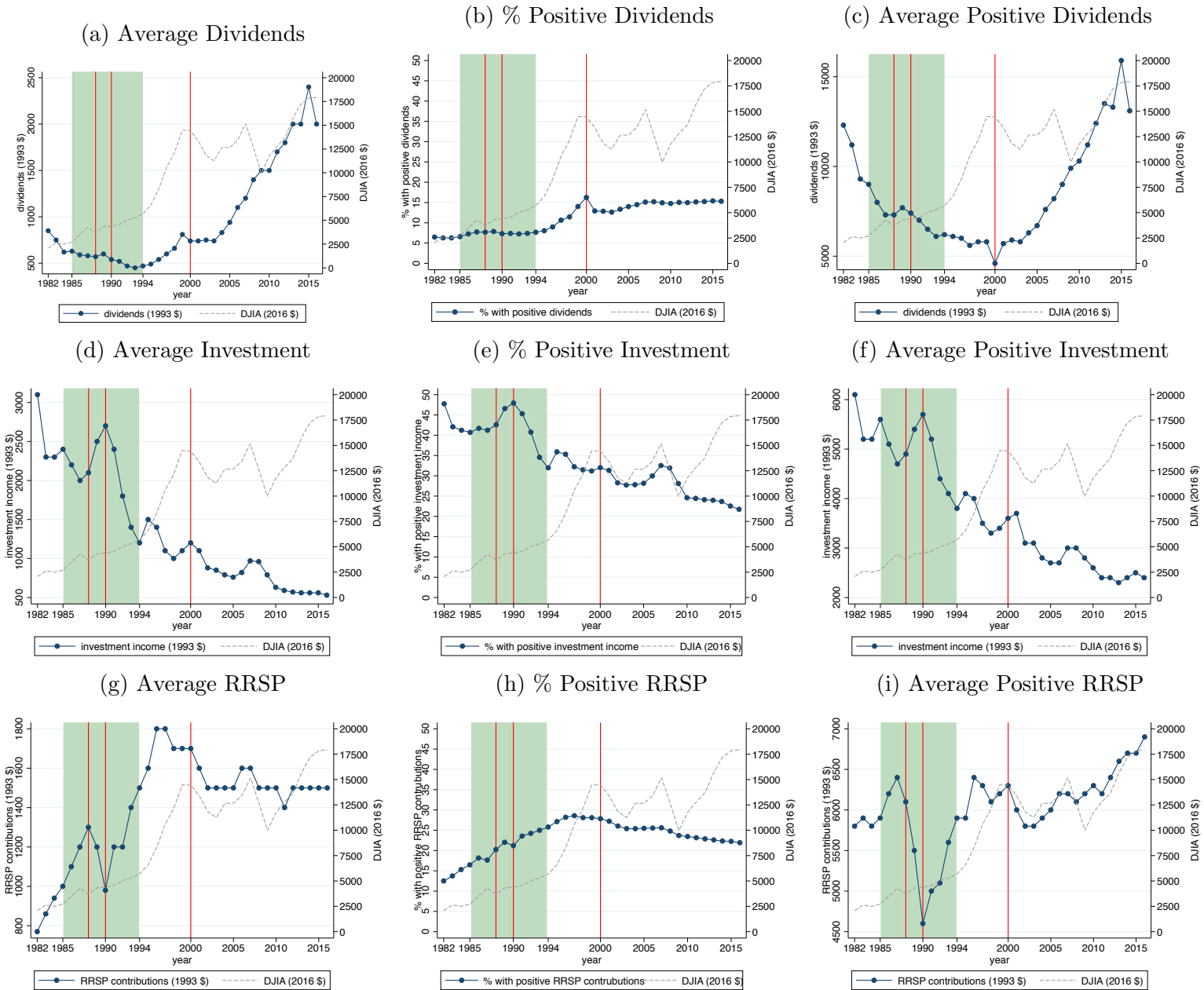
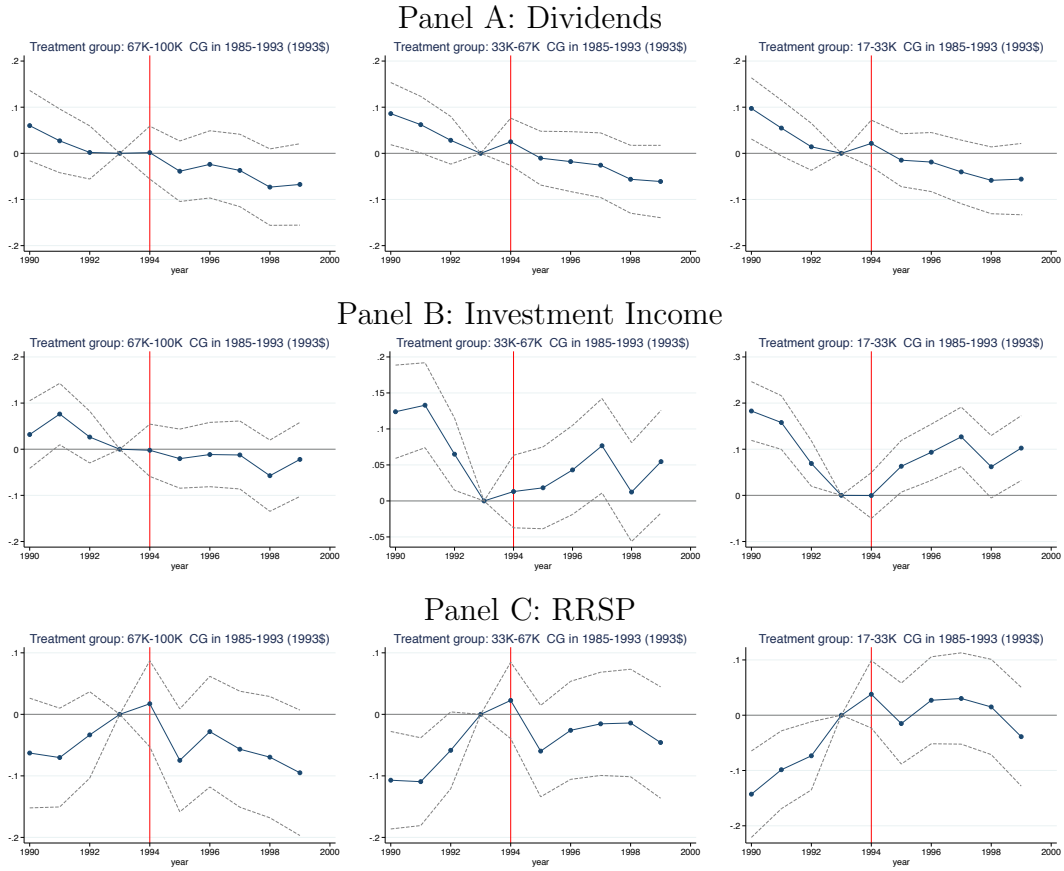
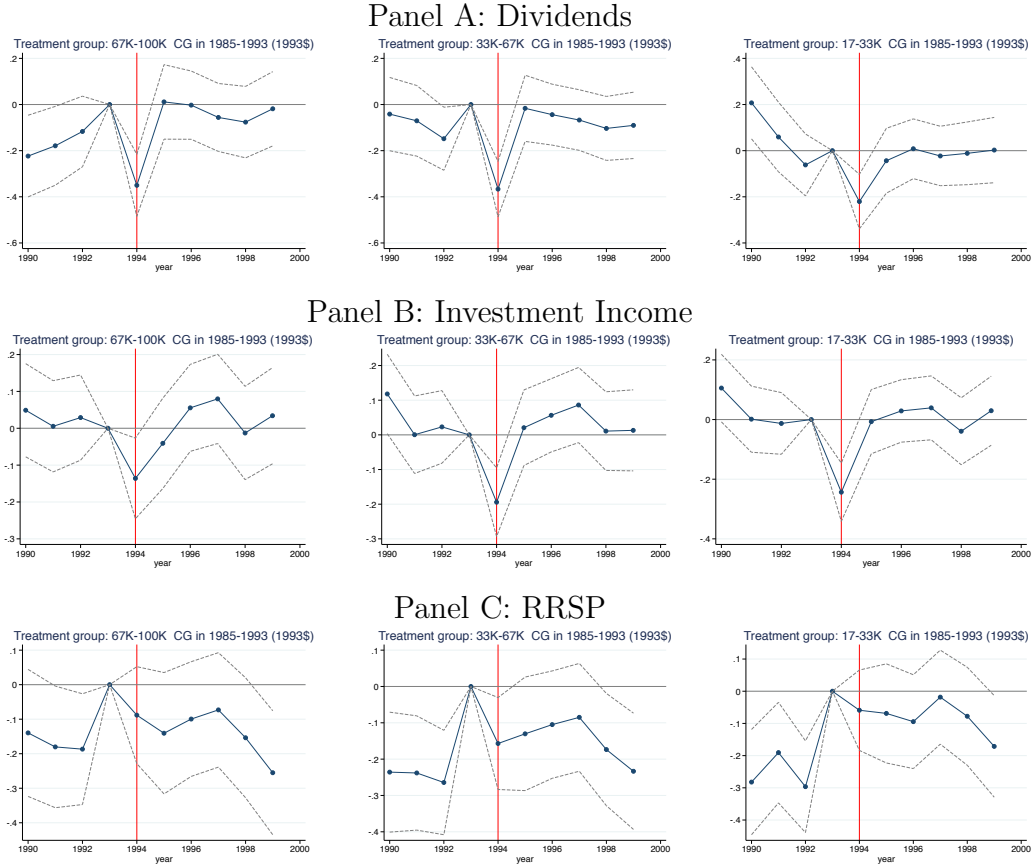


Figure F.16: Substitution Responses – Total Response



*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (1) described in Section 4.1 on the full sample. All values are increased by \$1 to allow for zero values. Dividend tax rules and RRSP limits are summarized in Table A.2. Investment income is subject to the regular income tax rates, which are summarized in Table 1. Number of observations: (a), (b), (c), (d) .

Figure F.17: Substitution Responses - Intensive Margin



*Notes:* Each figure plots the estimates of coefficients  $\gamma_\tau$  from estimating specification (1) described in Section 4.1 on the full sample. All values are increased by \$1 to allow for zero values. Dividend tax rules and RRSP limits are summarized in Table A.2. Investment income is subject to the regular income tax rates, which are summarized in Table 1. Number of observations: (a), (b), (c), (d) .