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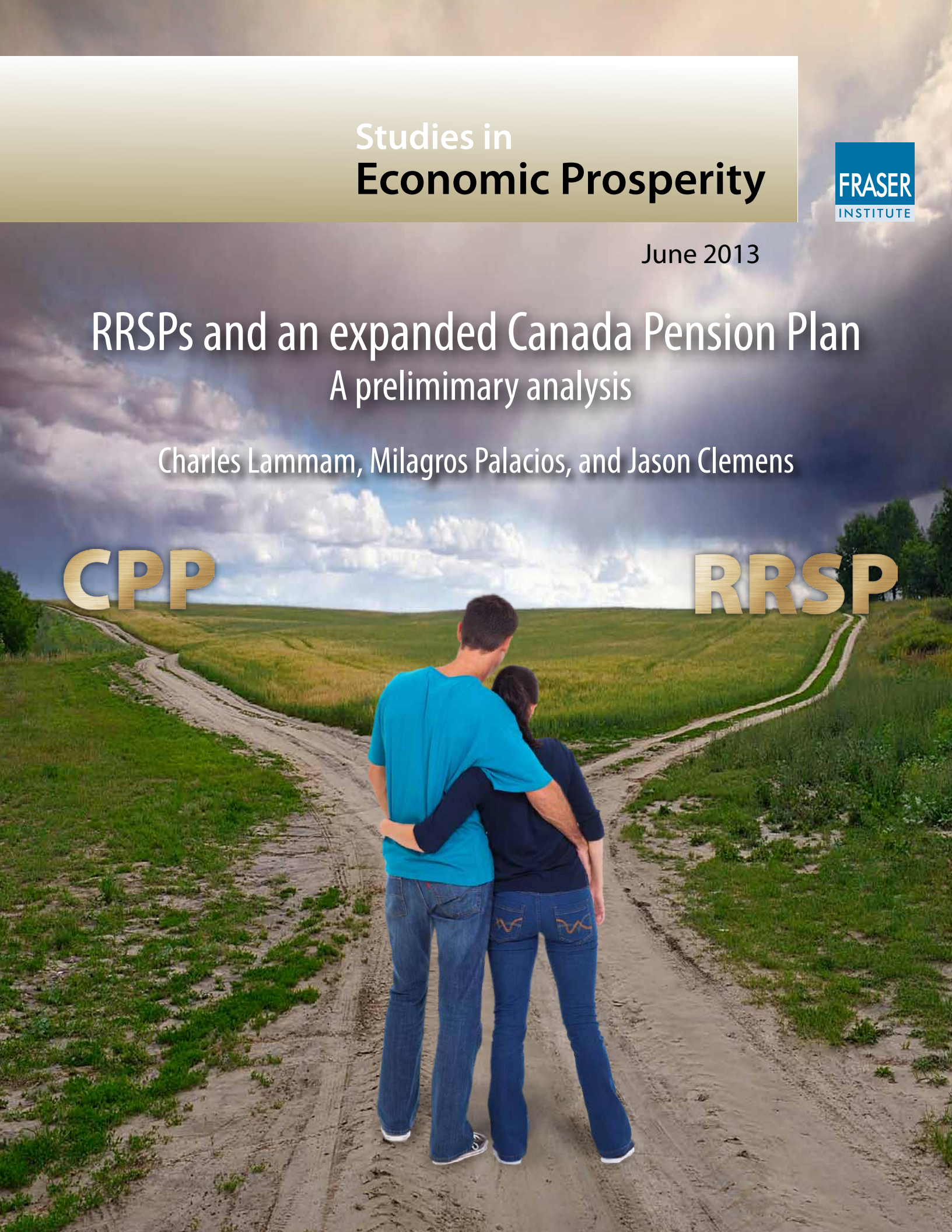
June 2013

RRSPs and an expanded Canada Pension Plan A preliminary analysis

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CPP

RRSP



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Executive summary

After their meeting in December 2012 at Meech Lake, Quebec, the federal and provincial-territorial finance ministers decided to put expansion of the Canada Pension Plan (CPP) and its sister program, the Quebec Pension Plan (QPP), back on the policy agenda. The idea of expanding the CPP is not new and, over the years, various individuals and groups have called for a more generous mandatory public pension system as a way to boost the overall retirement income of Canadians. With the global financial crisis of 2008-2009 and attendant decline in the value of retirement-savings portfolios, these calls have been renewed.

Recent proposals to expand the CPP call for an increase in the mandatory CPP contribution rate (payroll tax) to help fund larger benefits. Unfortunately, the debate about expanding the CPP has downplayed the basic economic insight that increasing mandatory contributions to the CPP could displace voluntary savings. Failure to account for this tendency could lead one to overestimate the increase in overall retirement savings that would result from an expanded CPP.

To find out if increases in mandatory contributions tend to displace voluntary savings, in *RRSPs and an expanded Canada Pension Plan* we provide a preliminary investigation of readily available historical data from the Canada Revenue Agency (CRA) on contributions to the Canada Pension Plan (CPP) and also to Registered Retirement Savings Plans (RRSPs), an important voluntary retirement savings vehicle in Canada. The period examined is 1993 to 2008, which includes several increases to the CPP contribution rate. Indeed, the CPP contribution rate nearly doubled between 1993 and 2003.

This preliminary investigation suggests that mandatory increases in CPP savings result in reduced voluntary savings in RRSPs. If the preliminary analysis is validated by more detailed microanalysis, the discussion about the efficacy of increasing the CPP contribution rate for all Canadian workers should then include the costs of reduced RRSP savings compared to increased CPP savings. Other aspects of this trade-off, such as the comparative benefits of the CPP (defined benefit in retirement) compared to the benefits of RRSPs (flexibility and choice), also need to be assessed and discussed.

The key to a successful system for providing retirement income through savings is a set of rules that allow for an optimal mix of savings for different people in different stages of their lives and with different preferences. There may be benefits to a compulsory expansion of the CPP. However, these benefits need to be weighed against the costs, which, as our analysis shows, likely include a reduction in voluntary RRSP savings.

Introduction

After their meeting in December 2012 at Meech Lake, Quebec, the federal and provincial-territorial finance ministers decided to put expansion of the Canada Pension Plan (CPP) and its sister program, the Quebec Pension Plan (QPP), back on the policy agenda.¹ This is a marked shift from just two years earlier when the idea was essentially discarded due to concerns from some provincial ministers. The ministers plan to revisit the issue and consider options at their next meeting, which is expected to take place later this year.

The idea of expanding the CPP is not new. Over the years, various individuals and groups have called for a more generous mandatory public pension system as a way to boost the overall retirement income of Canadians. With the global financial crisis of 2008-2009 and attendant decline in the value of retirement-savings portfolios, these calls have been renewed.² Recent proposals to expand the CPP vary in the magnitude of expansion desired but they all generally propose to increase the mandatory CPP contribution rate (pay-roll tax) to help fund larger benefits.³ Unfortunately, these proposals and the broader debate about expanding the CPP have downplayed a critical insight from basic economics that informs us that expanding the CPP could displace voluntary savings. Ignoring this tendency could lead one to overestimate the increase in overall retirement savings that would result from an expanded CPP.

To find out if increases in mandatory contributions tend to displace voluntary savings, in *RRSPs and an expanded Canada Pension Plan* we provide a

1. Quebec opted out of the CPP and maintains the separate Quebec Pension Plan. Since the CPP and QPP are similarly structured and offer broadly similar benefits, we only refer to the CPP in this report but the arguments also apply to the QPP.

2. Research by Canada's Working Group on Retirement Income Adequacy found that a broad-based retirement income problem did not exist in Canada before the 2008-2009 financial turmoil (see Mintz, 2009).

3. The proposals come from a diverse cross-section of individuals and groups. One of the more modest under consideration is the so-called "10-10-10 proposal", which would simultaneously increase the CPP's income replacement rate by 10 percentage points from 25% to 35%; increase the maximum annual pensionable earnings amount by \$10,000 from \$51,100 to \$61,100; and phase in these changes over 10 years. See Mallett (2013) for an analysis of the 10-10-10 proposal.

preliminary investigation of readily available historical data from the Canada Revenue Agency (CRA) on contributions to the Canada Pension Plan (CPP) and also to Registered Retirement Savings Plans (RRSPs), an important voluntary retirement savings vehicle in Canada. The period examined is 1993 to 2008, which includes several increases to the CPP contribution rate. Indeed, the CPP contribution rate nearly doubled between 1993 and 2003. These changes in the CPP contribution rate allow us to observe other changes in people's behaviour, including contributions to voluntary savings, that may be related.

The preliminary analysis of the readily available CRA data supports the prediction from economic theory that Canadians voluntarily saving in RRSPs substitute higher compulsory savings in the CPP with lower private voluntary savings in RRSPs. If larger mandatory CPP contributions do in fact displace voluntary RRSP contributions, this report suggests that the debate about reforming Canada's pension system should shift to a broader discussion of the comparative benefits of the CPP compared to voluntary savings vehicles like RRSPs.

Background on the CPP and RRSPs

Before discussing the framework with which economists examine how people save and the results from our preliminary analysis of historical contributions to RRSPs and the CPP, this section presents some basic information about the CPP and RRSPs.

The Canada Pension Plan

The CPP covers employed and self-employed workers in Canada through the payment of mandatory contributions. It is designed to replace about 25% of the earnings on which a person's contributions are based up to a maximum amount, referred to as the “year's maximum pensionable earnings”.⁴ Importantly, the CPP provides beneficiaries with a defined benefit in retirement, which can be drawn at a reduced rate as early as age 60 although the normal retirement age for CPP is 65.⁵

Contributions are paid on earnings above the annual exemption (\$3,500) and below the year's maximum pensionable earnings (\$51,100 in 2013). The contribution rate—which is a payroll tax—is 9.9%;⁶ it is split equally between the employee (4.95%) and the employer (4.95%).⁷

4. CPP retirement benefits depend on how much and for how long beneficiaries contribute and the age at which they retire. For details on how CPP benefits are calculated for individual contributors, see <<http://www.servicecanada.gc.ca/eng/isp/cpp/soc/50-70/yourcpp.shtml>>.

5. If Canadians draw on the CPP early, their benefits are reduced by a set percentage for each month the CPP is taken before age 65.

6. CPP outlays, unlike other public pension programs, such as Old Age Security (OAS) and the related Guaranteed Income Supplement (GIS), are funded through dedicated payroll taxes. The tax contributions in excess of benefit payouts are invested into an investment fund managed by the Canada Pension Plan Investment Board.

7. There is a distinction between the legal and economic incidence of taxes. The legal incidence of a tax (that is, how the tax is “split” between workers and employers) is irrelevant for the economic incidence, which is about who actually bears the cost of taxation. In the case of a CPP payroll tax, although the CPP contribution rate is equally “split” between

Table 1 displays the CPP contribution rate and minimum and maximum income thresholds for contributing from 1993 to 2013. The contribution rate steadily increased from 1993 to 2003 culminating in a near doubling within the span of a decade (5.0% to 9.9%). The increase in the contribution rate during this period coincided with important reforms to the CPP announced in 1997 that put the program on a more stable and sound financial footing.⁸ The maximum pensionable earnings amount increased every year in nominal terms from \$33,400 in 1993 to \$51,100 in 2013. To reiterate, earnings beyond \$51,100 (in 2013) are not subject to the CPP payroll tax.

Registered Retirement Savings Plans

RRSPs allow Canadians to save for retirement income on a tax-deferred basis, meaning that contributions are made using income before taxes. Investment income and capital gains earned in the plans are exempt from taxation. Withdrawals from an RRSP are taxable as normal income while contributions to an RRSP are deductible from one's income, which allows people to defer their personal income taxes.⁹ Contributions to Registered Pension Plans (RPPs) and RRSPs cannot exceed 18% of annual earnings up to a maximum dollar amount. Unused RRSP contribution room can be carried forward.

employer and employee, it is the employee that ultimately pays the entire CPP contribution. The employer's contribution simply forms part of the employee's overall compensation.

8. In the early 1990s, there was growing recognition by all governments and the public that the revenues and accumulated assets of the CPP were insufficient to weather the pressures expected from the retirement of the baby boomers without marked increases in the payroll tax, reducing benefits, and/or accumulating government debt. In 1997, important reforms were announced to alleviate some fiscal pressure and, in part, put CPP on a more sustainable path. The CPP reforms in 1997 entailed four broad changes: (1) increasing the contribution rate earlier than scheduled so that larger surpluses could be recorded sooner and invested to meet obligations; (2) establishing the CPP Investment Board (CPIB) to actively invest the surplus funds with an aim to maximize the risk-adjusted rate of return of CPP assets; (3) freezing the value of earnings exempted from the payroll tax at \$3,500 so that more individuals would contribute to the plan; and (4) bringing in a series of small benefit changes intended to reduce overall benefit spending. For additional details on the changes to CPP in 1997, see <http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/oca/reports/PPP/cpp16_e.pdf>. Importantly, the 1997 reforms likely had the effect of changing the expectations of Canadians regarding the CPP benefits they would receive. That is, as the program moved away from a pay-as-you-go model to partial funding, Canadians' expectation of actually receiving the government's promised CPP benefits likely increased.

9. Since withdrawals from an RRSP are taxed as regular income, the lower dividend and capital gains taxes are offset.

Table 1: CPP contribution rate and minimum and maximum income thresholds for contributing, 1993–2013

	CPP contribution rate (%)	Minimum annual pensionable earnings (\$)	Maximum annual pensionable earnings (\$)
1993	5.0	3,300	33,400
1994	5.2	3,400	34,400
1995	5.4	3,400	34,900
1996	5.6	3,500	35,400
1997	6.0	3,500	35,800
1998	6.4	3,500	36,900
1999	7.0	3,500	37,400
2000	7.8	3,500	37,600
2001	8.6	3,500	38,300
2002	9.4	3,500	39,100
2003	9.9	3,500	39,900
2004	9.9	3,500	40,500
2005	9.9	3,500	41,100
2006	9.9	3,500	42,100
2007	9.9	3,500	43,700
2008	9.9	3,500	44,900
2009	9.9	3,500	46,300
2010	9.9	3,500	47,200
2011	9.9	3,500	48,300
2012	9.9	3,500	50,100
2013	9.9	3,500	51,100

Note: CPP contribution rate combines rates of employees and employers.

Sources: Service Canada (2013); Ferley et al. (2010).

Table 2 displays the maximum RRSP contribution in nominal dollars for the period from 1993 to 2013. It also shows the income level at which RRSP contributions reach a maximum, assuming an 18% contribution rate. The maximum contribution amount increased from \$12,500 in 1993 to \$23,820 in 2013. The income at which contributions reach a maximum also increased over the period from \$69,444 to \$132,333.

RRSPs and the CPP have key similarities. Both retirement-savings vehicles allow Canadians to reduce their personal income-tax obligation in the year contributions are made, although the tax treatment differs.¹⁰ RRSPs and the CPP, to varying degrees, also tie the level of benefits to contributions. A key difference is that RRSP benefits not only depend on contributions but also rates of return earned in people's investment portfolio. While the CPP is a contributory, earnings-related program (in that the qualifying level of benefits depends on contributions), the benefits are defined and in principle do not vary according to the performance of the CPP's investment fund.¹¹ RRSPs and the CPP also differ in the flexibility they afford contributors in the use to which their savings are put while they are alive and after their death.¹² The differences between RRSPs and the CPP mean they are not perfect substitutes.

10. A worker's CPP premiums are credited at the lowest personal income-tax rate, not fully deductible like RPP and RRSP contributions.

11. Indeed, the expected CPP benefits are not necessarily equal to the expected returns people get through RRSPs. The return to the CPP for an individual is fixed by formula while the return to savings via RRSPs depends on the level of contribution and future returns, which are variable.

12. With RRSPs, the assets accumulated over time can be *fully* transferred from the contributor to a relative, including their children, upon death. The accumulated funds can also be withdrawn at any time to help with the purchase of a home, educational upgrading, or in case of an emergency. Specifically, under the Home Buyers' Plan, individual RRSP contributors can withdraw up to \$25,000 free of penalty and tax for the purpose of buying a home. Under the Lifelong Learning Plan, RRSP contributors can withdraw up to \$10,000 per year free of penalty and tax for full-time education or training for themselves or their spouse or common-law partners. Withdrawals for any purpose other than retirement, purchasing a home, or education are also possible but at the expense of significant penalties in the form of paying withholding taxes and losing RRSP contribution room.

Table 2: Maximum RRSP contributions in nominal dollars and income when contributions reach a maximum, 1993–2013

	Maximum RRSP contribution (\$)	Income (\$) at which contributions (at 18% rate) reach a maximum
1993	12,500	69,444
1994	13,500	75,000
1995	13,500	75,000
1996	13,500	75,000
1997	13,500	75,000
1998	13,500	75,000
1999	13,500	75,000
2000	13,500	75,000
2001	13,500	75,000
2002	13,500	75,000
2003	13,500	75,000
2004	14,500	80,556
2005	16,500	91,667
2006	18,000	100,000
2007	19,000	105,556
2008	20,000	111,111
2009	21,000	116,667
2010	22,000	122,222
2011	22,450	124,722
2012	22,970	127,611
2013	23,820	132,333

Note: The maximum RRSP contributions include Registered Pension Plan (RPP) contributions.

Sources: Canada Revenue Agency (2013b); calculations by authors

The economic framework for analyzing savings

A widely accepted framework among economists for analyzing how people save and consume is the life-cycle model of income. The life-cycle model is based on the early works of Nobel-Prize-winning-economists Milton Friedman and Franco Modigliani.¹³ Their contributions help explain how people consume and save over their lifetimes. An important insight of the general model is that individuals and households are forward looking and that they make decisions about consumption and savings today based on their expectations of the future.

A key insight found in Friedman's work is that people make current consumption decisions based on the resources they expect to have over their lifetime.¹⁴ More specifically, they aim to even out or "smooth" their lifetime consumption in a way that maintains a relatively stable lifestyle, despite temporary fluctuations in income.¹⁵ The level of consumption they target is based on their preferences and how much income they *expect* to earn during their lifetime. The model suggests consumption patterns may change in response to permanent, but not temporary, changes in income since it is permanent changes that alter one's lifetime wealth.

In plain language, this means people form an expectation of their lifetime earnings, or what Friedman referred to as their "permanent income," when making decisions about consumption today and thus savings. Temporary increases in income, such as a one-time tax rebate, are seen both conceptually and empirically as having almost no effect on a person's consumption because such changes are temporary and do not affect individuals' expectations about their income over time. Alternatively, changes

¹³. See Milton Friedman (1957) and Franco Modigliani (2005) for references to the original works describing the life-cycle model.

¹⁴. Friedman's theory is known as the "permanent income hypothesis".

¹⁵. In practice, people use the following information to calculate a stable living standard: current and future taxes; future sources of income; future family circumstances; inflation; rates of return on savings; and future expenses.

that alter a person's expectations, such as an unanticipated promotion, do affect consumption behaviour and thus their savings.¹⁶

Consumption smoothing has implications for how economists analyze savings. Broadly speaking, the amount of money people save is the income left over after allowing for their annual consumption spending. Insofar as younger and older people tend to have relatively low annual income, and insofar as our consumption spending tends to be less variable than our income, most of us will generally borrow during our younger years when income is relatively low, save during prime working years when income is high, and draw down savings ("dissave") during retirement when income falls (**figure 1**).

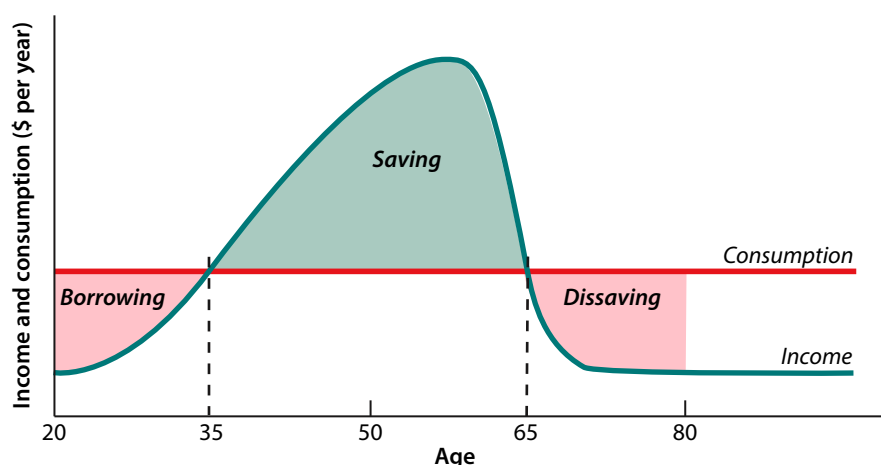
Canadians save for different reasons; they save for retirement, bequests, unforeseen events (losing a job or unexpected expenses), and big-ticket purchases (car or house). Saving for retirement occurs through many vehicles including the Canada Pension Plan (CPP), Registered Retirement Savings Plans (RRSPs), Registered Pension Plans (RPPs), Tax Free Savings Accounts (TFSAs), regular savings, and home equity, to name a few. The life-cycle model suggests that each of these retirement savings vehicles are, to some degree, substitutable. The fundamental idea is that those who increase their savings in one vehicle without a permanent change in their income will simply decrease savings in another vehicle with little impact on the overall level of savings. After all, it is life-time income and the desired level of consumption that dictates the amount of money left over for savings.

Let us now turn to the real-world implications of the life-cycle model to understand how economic theory predicts Canadian savers would respond to an expanded CPP.¹⁷ First, it is important to note that increasing the CPP contribution rate is fundamentally equivalent to increasing mandatory retirement savings over a range of income. The life-cycle model suggests that, if expanding the CPP has no effect on an individual's permanent income, Canadian savers will respond to higher mandatory retirement savings through the CPP by reducing their private voluntary retirement savings elsewhere in vehicles like RRSPs.¹⁸ Again, the basic idea is that people treat these and other forms

¹⁶. A promotion may be expected or unexpected. If a promotion is fully expected, then the model suggests it is already incorporated into a person's estimate of permanent income and therefore has little effect on consumption or savings.

¹⁷. See Feldstein (1974) for a seminal empirical analysis of public social security crowding out private savings in the United States using aggregate time-series data. His analysis conforms to the general life-cycle hypothesis and has spawned much subsequent research.

¹⁸. The CPP is a compulsory savings program and there are fundamentally two types of individuals: individuals who currently save voluntarily outside the CPP and those who have no savings outside CPP. For those who save voluntarily, the life-cycle framework predicts that raising the CPP will cause them to reduce savings elsewhere—be it RRSPs, RPPs, TFSAs, regular savings, or housing equity. The analysis in this report is concerned with substitution between CPP and RRSPs. For those who have no alternative savings,

Figure 1: Life cycle of income and consumption smoothing

of retirement savings as substitutes so that, if more money goes into one, less goes into another (although not necessarily on a one-for-one basis).

Despite being a widely accepted framework for analyzing savings behaviour, proposals to expand the CPP—some even by prominent economists—have downplayed the implications of the life-cycle’s framework.¹⁹ Not fully accounting for the possible crowding out of other voluntary savings runs the risk of overestimating the amount of total savings—and thus the benefits—to come from an expanded CPP. It is this possibility that has been overlooked in the broader debate about the CPP and, as a result, there has not been a complete examination of the likely benefits and drawbacks of an expanded CPP.

raising the CPP would force them to save when they would have chosen to consume today rather than save. For this latter group, total savings may increase with an expanded CPP. However, it is not clear that this is desirable since other programs of the public pension system, namely Old Age Security and the Guaranteed Income Supplement, may already have been sufficient to provide them with a retirement income adequate for a stable lifestyle.

¹⁹ For details on these proposals to expand the CPP, see Mintz and Wilson (2013), Wolfson (2011), Horner (2011), Kesselman (2010), Baldwin (2010), Denison (2009), and Dussault (2010). Organizations like the Canadian Labour Congress and the Canadian Association of Retired Persons (CARP) have also put forward proposals, which have been reviewed and evaluated by Kesselman (2010), Baldwin (2010), and Horner (2011). The impetus towards some recent proposals to expand the CPP is the concern that Canadians who have had their wealth reduced by the global financial crisis are unable to replenish it because investment returns are too low. Drawing from the behavioural economics literature, proponents of an expanded CPP implicitly assume that Canadians are either too short-sighted to save on their own behalf and/or unable to rebuild their savings in time to retire. They also assume that, if such a problem exists, it is broad in nature. If it is actually not, their concern would be better addressed through targeted public pension support programs like Old Age Security and Guaranteed Income Supplement, not a broad-based program like the CPP.

Do Canadians reduce RRSP contributions when CPP contributions increase?

With the life-cycle framework in mind, we undertake in this section a preliminary analysis of the possibility of a substitution between compulsory CPP and voluntary RRSP contributions in light of increases to the CPP contribution rate during the 1990s and early 2000s.²⁰ Indeed, a marked increase in the CPP contribution rate from 1993 to 2003 provides a natural experiment to explore what happened to contributions to RRSPs, an important voluntary savings vehicle in Canada that can be fairly easily adjusted. It is important to reiterate that RRSP and CPP savings are not perfect substitutes, so one-for-one substitution should not be expected.

While the conclusions drawn from the preliminary analysis are by no means determinative, they suggest that a substitution between CPP and RRSP contributions occurred as the CPP contribution rate increased. This conforms to the economic framework explained previously. Our analysis is a preliminary investigation based on readily available data but a more rigorous method for analyzing the life-cycle's framework would examine microdata on individual Canadian tax-filers or aggregate data over a longer time period. It would also control for factors explaining changes in RRSP contributions other than the CPP contribution rate and demographic factors (age and income) such as general economic conditions, personal income-tax rates, asset price growth (particularly home equity), stock market returns, and the like.²¹

20. We do not focus on Registered Pension Plans (RPPs) because contributions to this retirement savings vehicle are not as easily adjustable as RRSPs and in many cases the contributions are compulsory. Some RRSPs are sponsored by employers but data from the Canada Revenue Agency does not allow us to distinguish between the contributions of employers and employees. We also do not focus on voluntary contributions to TFSAs since the introduction of TFSAs in 2009 occurred after the latest available year of data for the other variables examined. In addition, there is a critical difference between TFSAs and RRSPs: the latter are contributed based on pre-tax earnings whereas the former is not.

21. See Ferley et al. (2012) for a statistical analysis of aggregate RRSP contribution drivers from 1968 to 2008. Unfortunately, these researchers did not test whether CPP contributions affect RRSP contributions. Fougère (2002) did, however, test the impact of

Data—Canada Revenue Agency

Our preliminary analysis examines aggregate statistics of individual tax-filers over the period from 1993 to 2008 on voluntary RRSP and mandatory CPP contributions. The data are from the Canada Revenue Agency (CRA) and are readily available for only the 1993 to 2008 tax years. Unfortunately, the RRSP and CPP data are not *readily* available for tax years before and after this period or at the individual (micro-) level.

The aggregate CRA data on CPP and RRSP contributions are broken down by age and income groups. There are three age groups: (1) under 45, (2) 45 to 65, and (3) over 65. There are nine income groups: under \$10,000; \$10,000–\$20,000; \$20,000–\$30,000; \$30,000–\$40,000; \$40,000–\$50,000; \$50,000–\$60,000; \$60,000–\$80,000; \$80,000–\$100,000, and over \$100,000).²² The age and income data are presented by the CRA in cross-tabular format.²³

Age and income groups to analyze

When examining whether Canadian savers reduce voluntary savings to RRSPs in response to higher forced savings to the CPP, it is important to narrow the analysis to people whose RRSP savings behaviour would actually be influenced by increased mandatory CPP savings. For instance, it makes little sense to analyze the behaviour of those who are over the age of 65 since they are most likely in retirement and drawing down their retirement savings, not adding to them. In addition, the life-cycle model suggests that some Canadians in the under-45 age group would not be significant savers—and thus RRSP contributors—since many in this age group are borrowers (**figure 1, p. 10**).²⁴ Unfortunately, the CRA's presentation does not allow us to disaggregate the data into age groups other than the three provided.

increased CPP contributions on RRSP contributions. After controlling for variables like age demographics of the population, overall economic conditions, changing marginal tax rates, and RPP contributions, he found that “an increase in [CPP] contributions is associated with a fall in the demand for RRSPs” (2002: 538). However, the effect was not statistically significant.

22. The measure of income used is total income assessed, the measure available from the CRA data. It includes employment income, pension income, income from other sources that are taxable (such as Universal Child Care Benefit and rental income), income from self-employment, and other miscellaneous income like scholarships. Total income assessed excludes non-taxable income such as the Child Tax Benefit and the War Veterans' Allowance.

23. Statistics Canada also compiles data on RRSP contributions but its data are not presented in cross-tabular format by age and income groups.

24. The under-45 age group includes a broad range of tax-filers ranging from indebted students to entry and mid-level workers. Some of the latter can be savers but the CRA data does not allow us to break down the age group further.

The most relevant age group based on the life-cycle model is the 45–65 age group since Canadians in this group are in their prime working years—a stage in life when earnings are relatively high and assets are being accumulated. Our later analysis includes this group and the under-45 group but excludes the over-65 age group.

It also makes little sense to examine the behaviour of those whose income puts them in the under-\$10,000 group. Canadian earners up to this income level typically pay no income tax (Clemens et al., 2013), which means there is little reason to contribute to RRSPs since deductions are of no help.²⁵ In addition, government programs provide sufficient replacement income to maintain their living standard in retirement (Clemens, 2001).

Those earning between \$10,000 and \$50,000 are the most likely to experience the substitution effect. People in this income range can garner tax savings from making RRSP contributions and they are within the upper bound of \$50,000, which is close to the maximum annual pensionable earnings amount (the income level over which Canadians are longer required to make CPP contributions).²⁶

Finally, while Canadians earning over the \$100,000 income threshold tend to contribute to RRSPs at a relatively high rate, the substitution effect for them may be clouded by the fact that this range of income overlaps with the amount at which RRSP contributions reach a maximum (assuming an 18% contribution rate).²⁷ In other words, the upper ceiling on RRSP contributions may distort the observed substitution between the CPP and RRSPs. It therefore makes sense to exclude those earning over \$100,000 from the analysis.

Table 3 breaks down the aggregate RRSP data from the CRA by age and income groups for three RRSP measures: (1) RRSP contributors as a percentage of tax-filers; (2) RRSP contributions as a percentage of income; and (3) RRSP contributions per tax filer. These are the three RRSP measures we use to explore the substitution hypothesis in the analysis below. The three age groups in table 3 are those used by the CRA and we show four income groups: \$10,000–\$50,000 and \$50,000–\$100,000, and, for the sake of comparison, under \$10,000 and over \$100,000. All data are annual averages for the period from 1993 to 2008.

²⁵ One important reason that Canadians below this threshold pay no income tax is the federal basic personal amount, which is the amount all Canadians can earn tax free. (The provinces have their own basic personal exemptions which vary by income threshold.) In 2013, the federal basic personal amount is \$11,038. People in the under-\$10,000 income group may also have little incentive to contribute to RRSPs because they are basically deferring taxes from a low rate to a future period with some positive probability of a higher marginal tax rate.

²⁶ In 2013, the maximum pensionable earnings amount is \$51,100 (see table 1).

²⁷ In 2013, the maximum RRSP contribution amount is \$23,820. For someone contributing at the rate of 18% of income, RRSP contributions would reach a maximum at income of \$132,333.

Table 3: RRSP contributors as a percentage of tax filers, RRSP contributions as a percentage of income, and RRSP contribution per tax filer by age and income groups, 1993–2008 average

	RRSP contributors (% of tax filers)	RRSP contributions (% of income)	RRSP contribution per tax filer (\$)
Under 45 years			
<i>Under \$10,000</i>	2.2%	0.5%	23
<i>\$10,000–\$50,000</i>	32.3%	3.0%	777
<i>\$50,000–\$100,000</i>	67.8%	5.4%	3,513
<i>Over \$100,000</i>	80.6%	5.1%	9,426
Aged 45 to 65 years			
<i>Under \$10,000</i>	3.4%	1.1%	48
<i>\$10,000–\$50,000</i>	36.0%	4.0%	1,119
<i>\$50,000–\$100,000</i>	66.4%	5.7%	3,801
<i>Over \$100,000</i>	73.9%	4.4%	9,326
Over 65 years			
<i>Under \$10,000</i>	0.3%	0.1%	4
<i>\$10,000–\$50,000</i>	3.2%	0.5%	102
<i>\$50,000–\$100,000</i>	16.2%	1.8%	1,196
<i>Over \$100,000</i>	27.3%	1.9%	4,449

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Two key observations emerge from table 3. First, for all three age groups, the percentage of tax filers contributing to RRSPs and the value of the contributions (both as a share of income and in dollar terms) generally increases with income.²⁸ Second, RRSP contributors and contributions are much less pronounced among those in the over-65 age group than those in the 45–65 and under-45 age groups. Both of these observations are in line with expectations.

²⁸ The one exception is on the second measure (RRSP contributions as a percentage of income). Here the percentage contributed for the under-45 and 45–65 age groups decreases going from the \$50,000–\$100,000 to the over-\$100,000 income groups. The RRSP ceiling for maximum contributions is the likely reason for this anomaly.

Analysis—preliminary results point to substitution between CPP and RRSPs

The results of our preliminary investigation are presented below for each of the three RRSP measures. Regardless of which measure is used, the results suggest that Canadians, when they save for retirement, substitute between CPP and RRSPs. That is, as mandatory savings to the CPP increased over the period from 1993 to 2008, aggregate RRSP savings declined.²⁹

Measure 1 RRSP contributors as a percentage of tax filers

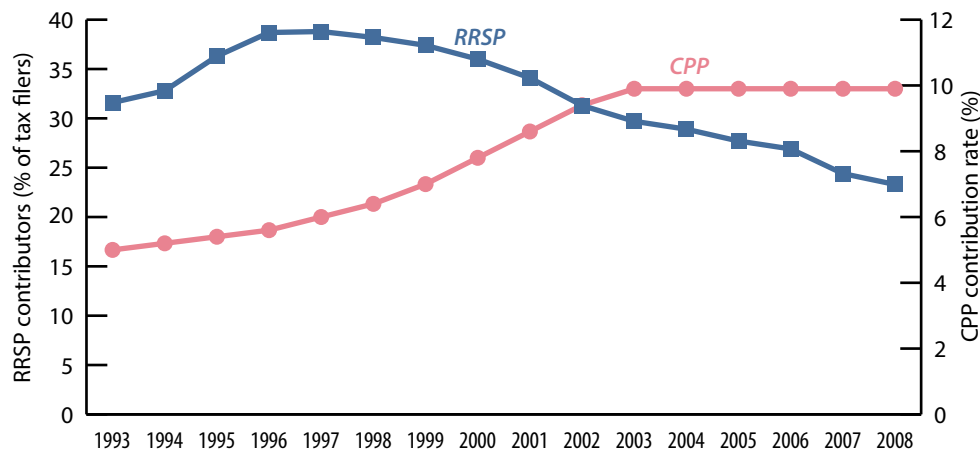
Figures 2a, 2b, 2c, and 2d present the aggregated data for the first measure, the percentage of tax filers contributing to RRSPs. In each of the figures, the data is presented alongside the CPP contribution rate from 1993 to 2008. Figures 2a and 2b display data for Canadians in the under-45 age group in two income groups: \$10,000–\$50,000 and \$50,000–\$100,000. Figures 2c and 2d display data for Canadians in the 45-65 age group in those same income groups. **Table 4** gives the underlying data.

What is immediately apparent from all four figures is the negative relationship between the number of RRSP contributors and the CPP contribution rate. That is, the percentage of tax filers contributing to RRSPs in each age and income group decreases as the CPP contribution rate increases. This is particularly evident over the period from 1997 to 2003 when marked increases in CPP rates came into effect following the reforms of 1997. Interestingly, these rate hikes were mostly unexpected, which may explain the initial slow decline in the number of RRSP contributors. Had it been announced and expected before the reforms took place, economic theory suggests the response among RRSP contributors would have been more immediate (Auerbach and Kotlikoff, 1987).

The results are broadly consistent across age and income groups. So rather than discuss the specific results for each age and income group, we only note the results for the most relevant group: Canadians aged 45–65 with income between \$10,000 and \$50,000. In 1993, 40.2% of tax-filers in this group contributed to RRSPs with the percentage falling to 33.0% by 2003—a decline of 17.9%. The CPP contribution rate increased from 5.0% to 9.9% (nearly doubling) over this period.

²⁹ The variables used in our preliminary analysis are readily available proxies for what really matters, which is the relationship between CPP contributions and expected CPP benefits and RRSP contributions and expected RRSP returns.

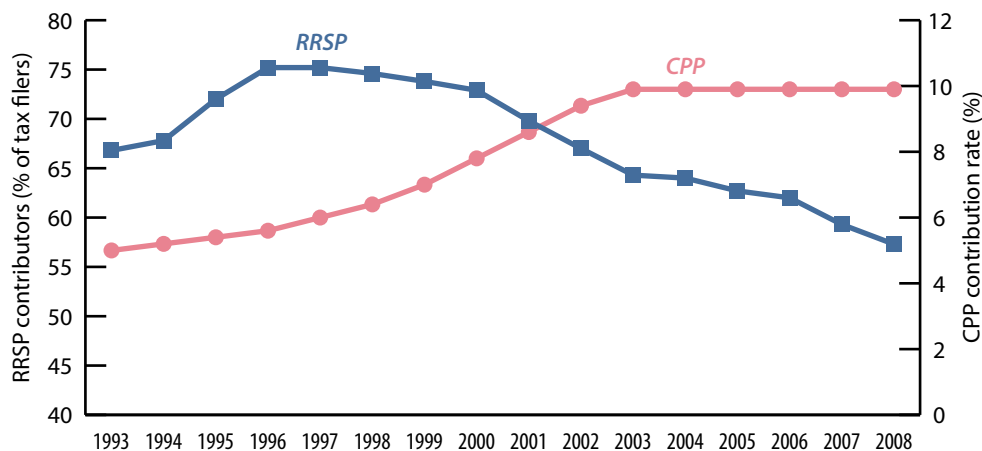
Figure 2a: RRSP contributors as percentage of tax filers and CPP contribution rate, 1993–2008; Canadians under age 45 with income \$10,000–\$50,000



Note: CPP contribution rate combines rates of employees and employers.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); Service Canada (2013); calculations by authors.

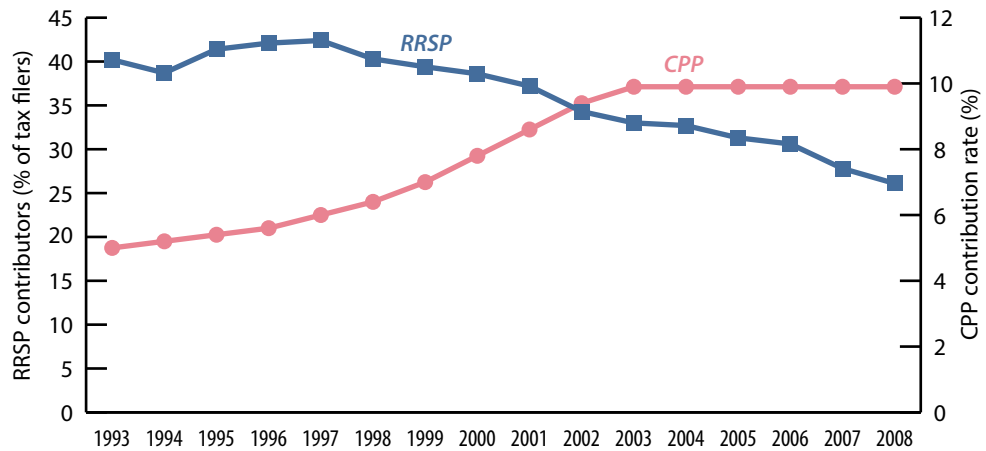
Figure 2b: RRSP contributors as a percentage of tax filers and CPP contribution rate, 1993–2008; Canadians under age 45 with income \$50,000–\$100,000



Note: CPP contribution rate combines rates of employees and employers.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); Service Canada (2013); calculations by authors.

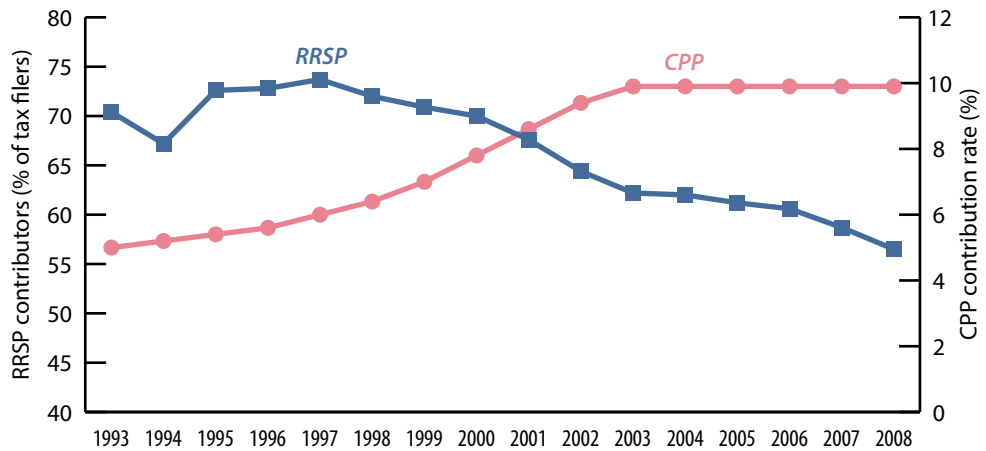
Figure 2c: RRSP contributors as a percentage of tax filers and CPP contribution rate, 1993–2008; Canadians aged 45–65 with income \$10,000–\$50,000



Note: CPP contribution rate combines rates of employees and employers.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); Service Canada (2013); calculations by authors.

Figure 2d: RRSP contributors as a percentage of tax filers and CPP contribution rate, 1993–2008; Canadians aged 45–65 with income \$50,000–\$100,000



Note: CPP contribution rate combines rates of employees and employers.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); Service Canada (2013); calculations by authors.

Table 4: RRSP contributors as a percentage of tax filers by age and income groups and the CPP contribution rate, 1993–2008

	Under 45		45 to 65 years		CPP contribution rate (%)
	\$10,000–\$50,000	\$50,000–\$100,000	\$10,000–\$50,000	\$50,000–\$100,000	
1993	31.6%	66.8%	40.2%	70.4%	5.0%
1994	32.8%	67.8%	38.7%	67.2%	5.2%
1995	36.3%	72.0%	41.4%	72.6%	5.4%
1996	38.7%	75.2%	42.1%	72.8%	5.6%
1997	38.8%	75.2%	42.4%	73.7%	6.0%
1998	38.2%	74.6%	40.3%	72.0%	6.4%
1999	37.4%	73.8%	39.4%	70.9%	7.0%
2000	36.0%	72.9%	38.6%	70.0%	7.8%
2001	34.1%	69.8%	37.2%	67.6%	8.6%
2002	31.3%	67.0%	34.3%	64.4%	9.4%
2003	29.7%	64.3%	33.0%	62.2%	9.9%
2004	28.9%	64.0%	32.7%	62.0%	9.9%
2005	27.7%	62.7%	31.3%	61.2%	9.9%
2006	26.9%	62.0%	30.6%	60.6%	9.9%
2007	24.4%	59.3%	27.8%	58.7%	9.9%
2008	23.3%	57.3%	26.1%	56.5%	9.9%

Note: CPP contribution rate combines rates of employees and employers.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); Service Canada (2013); calculations by authors.

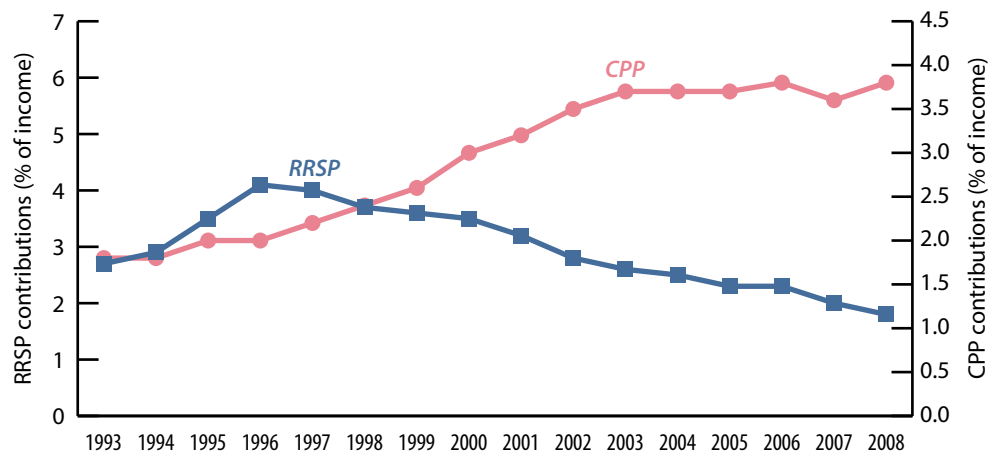
Measure 2 RRSP contributions as a percentage of income

Figures 3a, 3b, 3c, and 3d present data for the second measure, RRSP contributions as a percentage of income, along with data on CPP contributions as a percentage of income from 1993 to 2008. The under-45 age group is represented in figures 3a and 3b while the 45-65 age group is shown in figures 3c and 3d. For each age group, data is displayed for the same two income groups as above (\$10,000–\$50,000 and \$50,000–\$100,000). **Table 5** gives the underlying data.

A very similar story emerges as was observed with the previous measure: the percentage of income contributed to RRSPs declines as the percentage of income required for CPP increases. Specifically, for the 45-65 age group with income between \$10,000 and \$50,000, the proportion of income contributed to RRSPs is 4.4% at the start of the period in 1993 but decreases to 3.5% a decade later (in 2003). Meanwhile, the proportion contributed to CPP doubles from 1.5% of income to 3.0% over the same decade. This general trend of lower contributions to RRSPs coupled with higher mandated contributions to the CPP is observed in all four groups, albeit to varying degrees.

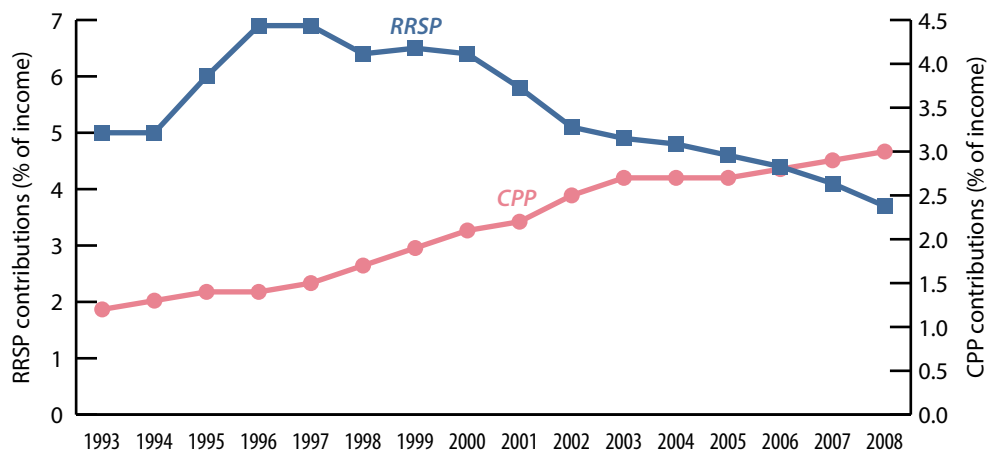
Figures 4a, 4b, 4c, and 4d present another way to look at the possible substitution effect. The figures show the total contributions to both RRSP and CPP as a percentage of income for the same age and income groupings from 1993 to 2008. Consider figure 4c, which shows data for Canadians aged 45 to 65 with income between \$10,000 and \$50,000. The top area is the percentage of income contributed to CPP and the bottom area is the percentage contributed to RRSPs. From 1993 to 2008, the top area (the proportion of CPP contributions) gradually grows while the bottom area (the proportion of RRSP contributions) shrinks.

**Figure 3a: RRSP and CPP contributions as a percentage of income, 1993–2008;
Canadians under age 45 with income \$10,000–\$50,000**



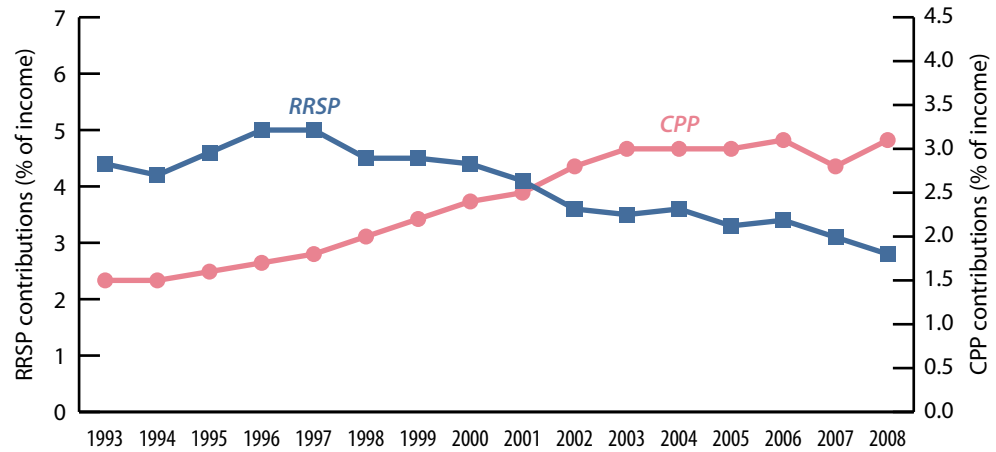
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 3b: RRSP and CPP contributions as a percentage of income, 1993–2008;
Canadians under age 45 with income \$50,000–\$100,000**



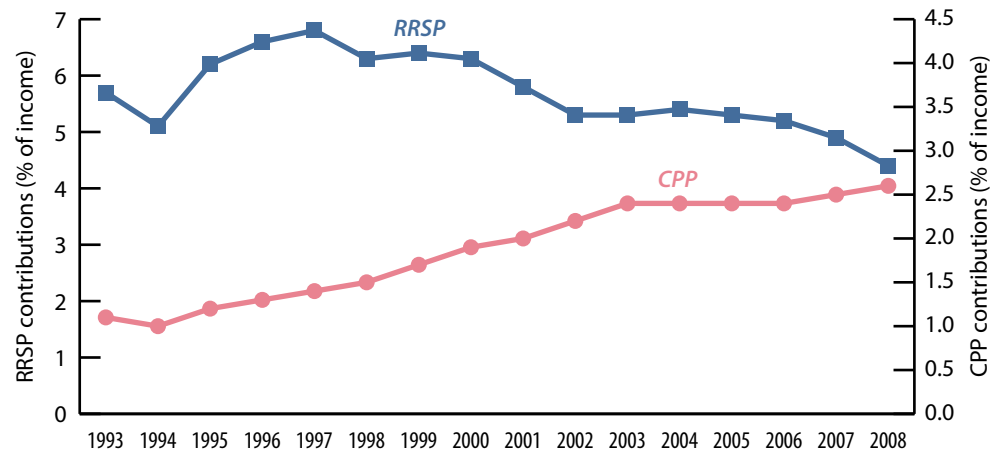
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 3c: RRSP and CPP contributions as a percentage of income, 1993–2008;
Canadians aged 45–65 with income \$10,000–\$50,000**



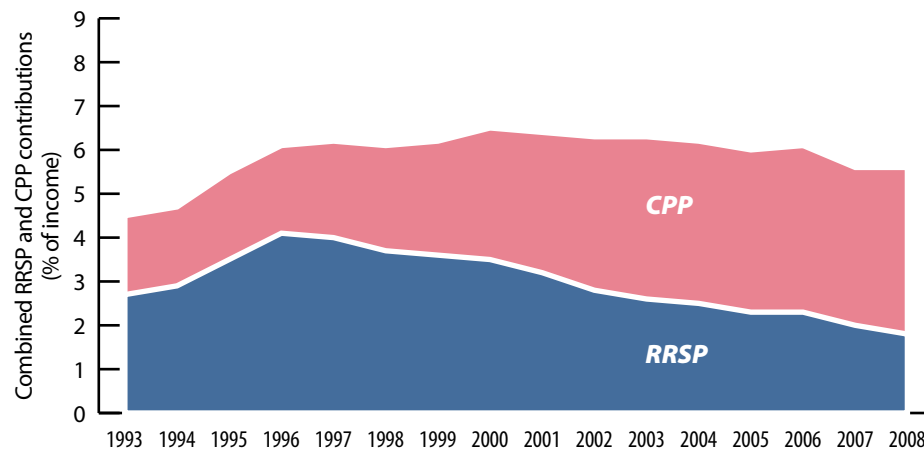
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 3d: RRSP and CPP contributions as a percentage of income, 1993–2008;
Canadians aged 45–65 with income \$50,000–\$100,000**



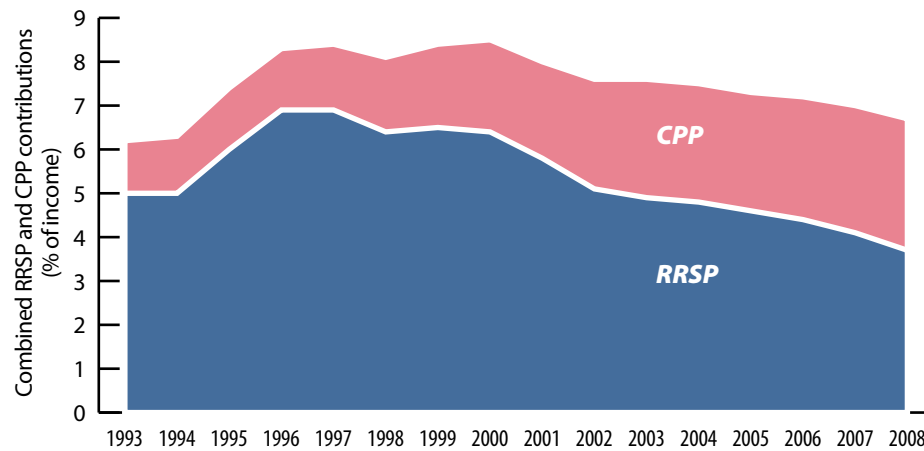
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Figure 4a: Combined RRSP and CPP contributions as a percentage of income, 1993–2008; Canadians under age 45 with income \$10,000–\$50,000



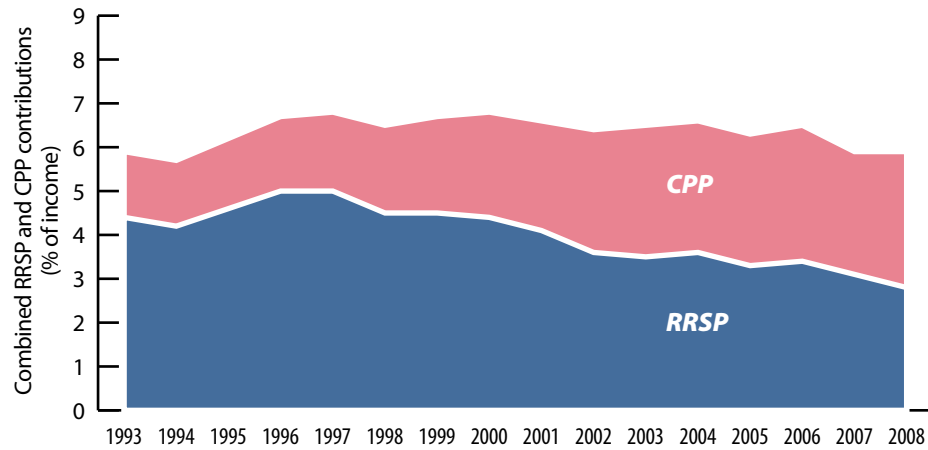
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Figure 4b: Combined RRSP and CPP contributions as a percentage of income, 1993–2008; Canadians under age 45 with income \$50,000–\$100,000



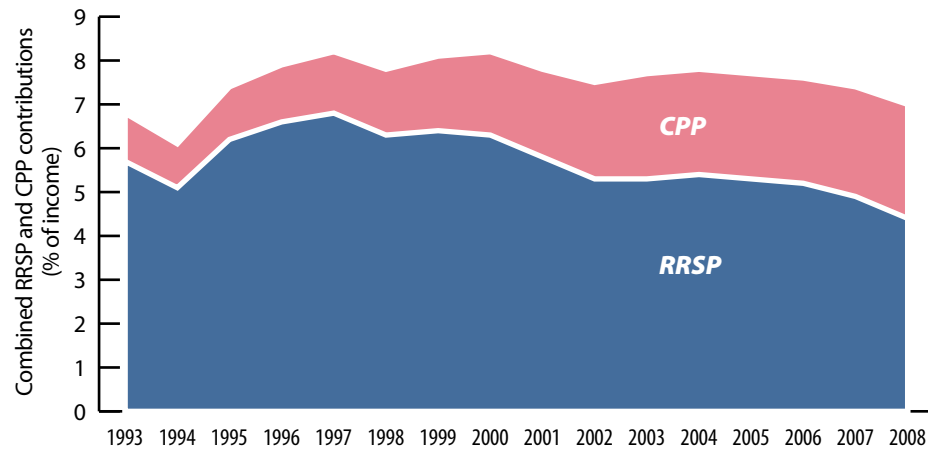
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Figure 4c: Combined RRSP and CPP contributions as a percentage of income, 1993–2008; Canadians aged 45–65 with income \$10,000–\$50,000



Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Figure 4d: Combined RRSP and CPP contributions as a percentage of income, 1993–2008; Canadians aged 45–65 with income \$50,000–\$100,000



Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Table 5: RRSP and CPP contributions as percentage of income by age and income groups, 1993–2008

	RRSP contributions as % of income				CPP contributions as % of income			
	Under 45		45 to 65 years		Under 45		45 to 65 years	
	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000
1993	2.7%	5.0%	4.4%	5.7%	1.8%	1.2%	1.5%	1.1%
1994	2.9%	5.0%	4.2%	5.1%	1.8%	1.3%	1.5%	1.0%
1995	3.5%	6.0%	4.6%	6.2%	2.0%	1.4%	1.6%	1.2%
1996	4.1%	6.9%	5.0%	6.6%	2.0%	1.4%	1.7%	1.3%
1997	4.0%	6.9%	5.0%	6.8%	2.2%	1.5%	1.8%	1.4%
1998	3.7%	6.4%	4.5%	6.3%	2.4%	1.7%	2.0%	1.5%
1999	3.6%	6.5%	4.5%	6.4%	2.6%	1.9%	2.2%	1.7%
2000	3.5%	6.4%	4.4%	6.3%	3.0%	2.1%	2.4%	1.9%
2001	3.2%	5.8%	4.1%	5.8%	3.2%	2.2%	2.5%	2.0%
2002	2.8%	5.1%	3.6%	5.3%	3.5%	2.5%	2.8%	2.2%
2003	2.6%	4.9%	3.5%	5.3%	3.7%	2.7%	3.0%	2.4%
2004	2.5%	4.8%	3.6%	5.4%	3.7%	2.7%	3.0%	2.4%
2005	2.3%	4.6%	3.3%	5.3%	3.7%	2.7%	3.0%	2.4%
2006	2.3%	4.4%	3.4%	5.2%	3.8%	2.8%	3.1%	2.4%
2007	2.0%	4.1%	3.1%	4.9%	3.6%	2.9%	2.8%	2.5%
2008	1.8%	3.7%	2.8%	4.4%	3.8%	3.0%	3.1%	2.6%

Note: Total income assessed includes employment income, pension income, income from other sources that are taxable (such as Universal Child Care Benefit and rental income), income from self-employment, and other miscellaneous income like scholarships. Total income assessed excludes non-taxable income such as the Child Tax Benefit and the War Veterans' Allowance.

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Measure 3 RRSP contributions per tax-filer

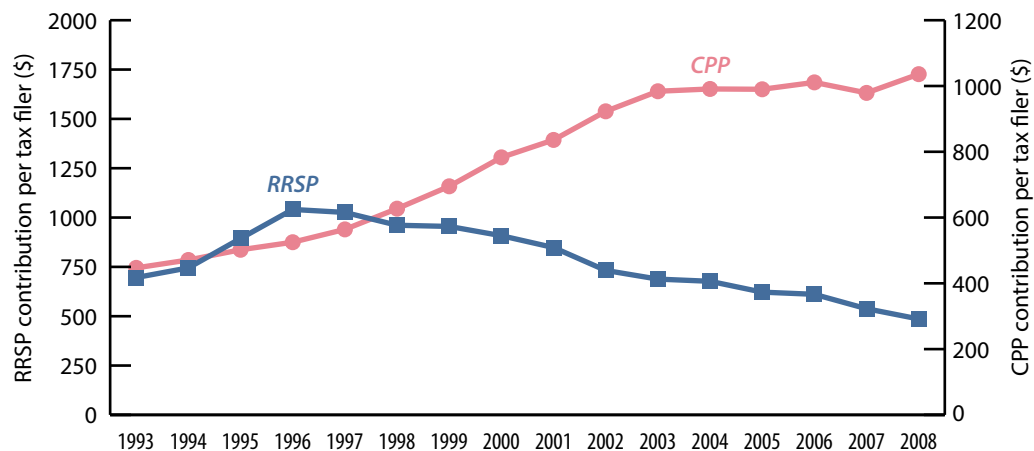
Finally, **figures 5a, 5b, 5c, and 5d** present data on the third measure, RRSP contributions per tax filer (in nominal dollars), along with nominal CPP contributions per tax filer over the 15-year period. The figures analyze data for the same two age groups (under 45 and 45–65) and income groups (\$10,000–\$50,000 and \$50,000–\$100,000). **Table 6** gives the underlying data.

Like the previous two measures, the third points to a negative relationship between CPP and RRSP contributions. That is, the nominal dollar value of RRSP contributions per tax filer decreases as the nominal dollar value of CPP contributions increases. For Canadians in the 45–65 age group earning income between \$10,000 and \$50,000, the nominal value of RRSP contributions peaked in 1997 at \$1,388 and decreased 42.6% to \$797 by 2008. Over the same period, nominal CPP contributions per Canadian tax filer increased 76.8% from \$496 to \$877.

In summary, our analysis based on aggregated, readily available data from the Canada Revenue Agency, suggests that Canadian savers reduce voluntary contributions to RRSPs in response to higher mandatory contributions to the CPP, which comports with basic economic theory. The relationship holds regardless of which measure is considered.³⁰

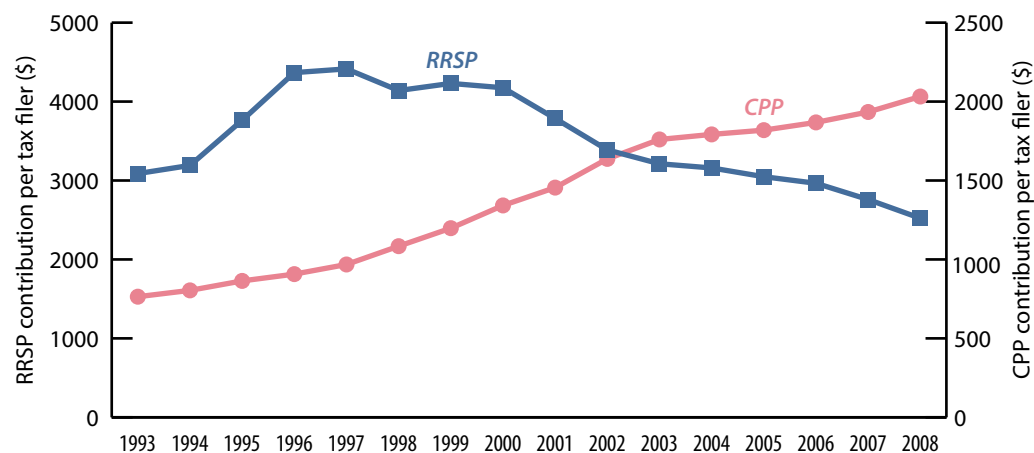
30. As mentioned, the analysis in this report does not account for factors other than increased mandatory CPP contributions that may have influenced the reduction in RRSP contributions. For instance, during the period under analysis, Canada's housing market saw considerable price increases and, since home equity is a form of savings, increased home values could have reduced the demand for other voluntary savings like RRSPs. The statistical analysis by Ferley et al. (2012) of aggregate RRSP contributions from 1968 to 2008 found that increased house prices were associated with reduced RRSP contributions. Unfortunately, they did not examine the impact of CPP contributions on RRSP contributions. The period under analysis, however, is also one where equities were enjoying above average returns, which, other things equal, should have encouraged savings via RRSPs. The fact that RRSP participation and contributions declined during this time may be more evidence of crowd out, though it is possible that the after-tax rate of return on home equity was higher than the rate received through RRSPs.

**Figure 5a: RRSP and CPP contributions (\$ nominal) per tax filer, 1993–2008;
Canadians under age 45 with income \$10,000–\$50,000**



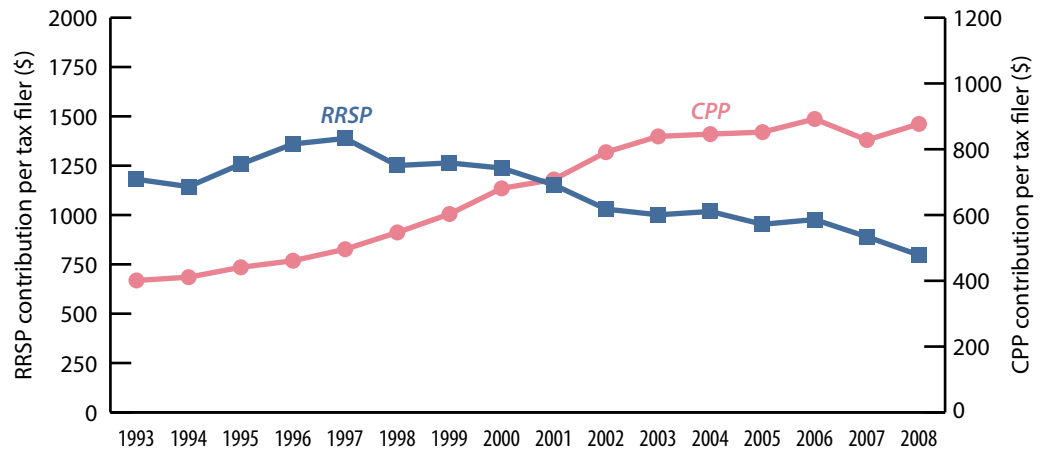
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 5b: RRSP and CPP contributions (\$ nominal) per tax filer, 1993–2008;
Canadians under age 45 with income \$50,000–\$100,000**



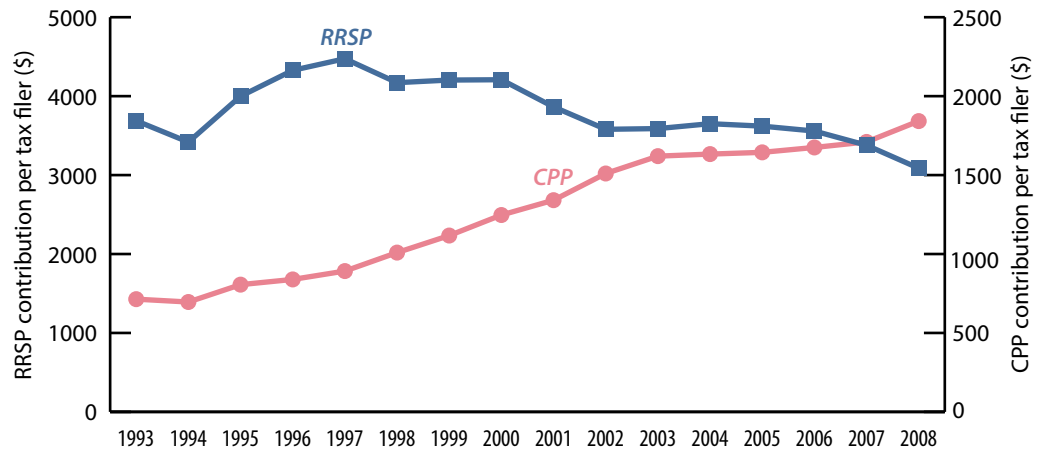
Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 5c: RRSP and CPP contributions (\$ nominal) per tax filer, 1993–2008;
Canadians aged 45–65 with income \$10,000–\$50,000**



Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

**Figure 5d: RRSP and CPP contributions (\$ nominal) per tax filer, 1993–2008;
Canadians aged 45–65 with income \$50,000–\$100,000**



Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Table 6: RRSP and CPP contributions per tax filer by age and income groups, 1993-2008

	RRSP contribution per tax filer (\$ nominal)				CPP contribution per tax filer (\$ nominal)			
	Under 45		45–65 years		Under 45		45–65 years	
	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000	\$10,000- \$50,000	\$50,000- \$100,000
1993	696	3,088	1,181	3,688	447	764	401	714
1994	745	3,191	1,144	3,418	471	804	411	696
1995	894	3,763	1,258	3,999	502	864	441	806
1996	1,041	4,367	1,360	4,327	525	907	461	839
1997	1,026	4,414	1,388	4,474	564	968	496	892
1998	961	4,140	1,251	4,171	627	1,084	547	1,009
1999	955	4,230	1,264	4,204	695	1,198	603	1,117
2000	908	4,175	1,238	4,208	783	1,342	681	1,247
2001	848	3,786	1,153	3,864	836	1,455	708	1,341
2002	732	3,388	1,030	3,580	923	1,637	791	1,510
2003	688	3,212	1,001	3,589	984	1,760	839	1,620
2004	677	3,159	1,018	3,651	991	1,792	846	1,633
2005	622	3,048	953	3,620	990	1,819	852	1,644
2006	611	2,965	977	3,558	1,011	1,868	892	1,675
2007	538	2,759	890	3,378	979	1,934	828	1,710
2008	486	2,522	797	3,087	1,036	2,032	877	1,842

Sources: Canada Revenue Agency (various issues); Canada Revenue Agency (2013a); Revenue Canada (1995, 1996, 1997); calculations by authors.

Conclusion

The preliminary investigation of readily available aggregate data from the Canada Revenue Agency (CRA) suggests that mandatory increases in CPP savings result in reduced voluntary savings in RRSPs. The observed negative relationship is consistent with the life-cycle framework used by economists for analyzing people's consumption and savings behaviour. If the preliminary analysis is validated by more detailed microanalysis, this should shift the debate about mandatorily increasing the CPP.

The discussion regarding the efficacy of increasing the CPP contribution rate for all Canadian workers would then, at a minimum, include the costs of reduced RRSP savings compared to increased CPP savings. Other aspects of this trade-off, such as the comparative benefits of the CPP (defined benefit in retirement) compared to the benefits of RRSPs (flexibility and choice), also need to be assessed and discussed.

The key to a successful system for providing retirement income through savings is a set of rules that allow for an optimal mix of savings for different people in different stages of their lives with different preferences. There may be benefits to a compulsory expansion of the CPP. However, these benefits need to be weighed against the costs, which as our analysis shows likely include a reduction in voluntary RRSP savings.

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Acknowledgments

The authors would like to thank The Lotte & John Hecht Memorial Foundation and the Barbara and Bob Mitchell Fund for their generous support of this study. They also thank professors Marc Law of the University of Vermont and Stephen Easton of Simon Fraser University for their peer review and helpful comments. Any errors and omissions are the sole responsibility of the authors. Finally, the authors greatly appreciate the assistance and diligence of the Fraser Institute's publications team whose work improved the quality of the study. The views expressed in this study do not necessarily represent the views of the trustees, supporters, or other staff of the Fraser Institute.

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Date of issue

June 2013

Citation

Charles Lammam, Milagros Palacios, and Jason Clemens (2013). *RRSPs and an expanded Canada Pension Plan: A preliminary analysis*. Studies in Economic Prosperity. Fraser Institute. <<http://www.fraserinstitute.org>>.

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