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# SOCIAL AND ECONOMIC DIMENSIONS OF AN AGING POPULATION

Tax-Preferred Savings Accounts and Marginal Tax Rates: Evidence on RRSP Participation

Kevin Milligan

**SEDAP Research Paper No. 52** 

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### Tax-Preferred Savings Accounts and Marginal Tax Rates: Evidence on RRSP participation. \*

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#### Abstract

The percentage of Canadians with earned income who contributed to a Registered Retirement Savings Plan increased from 18.7 per cent in 1982 to 46.0 per cent in 1996. This period also saw many changes to the income tax structure. Using household expenditure survey data, I examine the influence of taxes on the decision to contribute to Registered Retirement Savings Plans. I improve on existing work by identifying the tax effect from within jurisdiction variation through time, rather than cross-sectional variation alone. I find that taxes do play a role in the contribution decision, but the effect of taxes is much smaller than suggested by the existing literature. A 10 percentage point increase in the marginal tax rate is estimated to increase the probability of participation by 8 per cent. This suggests that increases in marginal tax rates can explain only 5.1 per cent of the increase in Registered Retirement Savings Plan participation between 1982 and 1996. A carryforward mechanism for unused contribution room was introduced in 1991. I find evidence that the sensitivity of participation to future marginal tax rates increased after the introduction of the carryforward. This is consistent with the predictions of the model.

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#### 1 Introduction

Tax-preferred savings accounts receive different types of tax treatment in different countries. For example, standard Individual Retirement Accounts (IRAs) in the United States and Registered Retirement Savings Plans (RRSPs) in Canada are deductible in the year of contribution and taxable in the year of withdrawal, with income accruing tax-exempt in between. Contributions to Roth IRAs, however, are made out of after-tax income and are not taxed upon withdrawal, but income still accrues on a tax-exempt basis. In addition, unused contribution room (the difference between the statutory contribution limit and the contribution in a given year) can be carried forward for use in future years both in Canada for RRSPs and in the United Kingdom for Personal Pensions.<sup>1</sup> To predict what may happen to contributions to tax-preferred accounts under different regimes of tax treatment requires an understanding of how contributions are affected by taxes. In this paper, I consider how marginal tax rates affect the decision to contribute to tax-preferred savings accounts.

The participation decision is interesting for two principal reasons. First, the participation decision is an important margin. For RRSPs, the aggregate data presented below in Section 2 suggest that the increases in overall RRSP contributions have been a result of broader participation rather than larger contributions by contributors. For IRAs, the focus on the participation decision in the literature may result from the low (\$2000) contribution limit, which makes reasonable the decision to model contributions as all-or-nothing. Second, the study of the *levels* of contributions to tax-preferred savings accounts requires a good understanding of the participation decision.<sup>2</sup> In this way, improving the understanding of the participation decision can serve as a base for future work that addresses contribution levels.

A large literature has studied the role of taxes in the decision to contribute to tax preferred savings accounts.<sup>3</sup> O'Neill and Thompson (1987) find a strong relationship between marginal tax rates and participation in Individual Retirement Accounts using a single cross-section of tax filer data. They include no controls for the level of income, so it is not clear whether their estimate

<sup>&</sup>lt;sup>1</sup>Unused RRSP contribution room can be carried forward indefinitely in Canada. In the 1999 tax year, 203.6 billion of room was available for use in future years. (See Canada (various years).) In the United Kingdom, contribution room for Personal Pensions may be carried forward for 5 years, or back one year. (See United Kingdom (1999) .)

<sup>&</sup>lt;sup>2</sup>Because of non-participators and contribution limits, limited dependent variable methods are necessary. Participation equations are necessary for some of these methods.

<sup>&</sup>lt;sup>3</sup>See Hubbard (1984), O'Neill and Thompson (1987), Collins and Wyckoff (1988), Long (1988), Venti and Wise (1988), Long (1990), Long (1993), and Veall (1999). A general survey of several issues related to tax-preferred savings appears in Bernheim (1999).

measures a tax effect or an income effect.<sup>4</sup> Long (1988) shows that the inclusion of a quadratic in income in the same regressions run by O'Neill and Thompson leads to a halving of the estimated impact of taxes on participation. Identification here arises from cross-sectional differences in tax rates across states. However, if unobserved state characteristics are correlated both with tax rates and with IRA contribution behaviour, then this identification strategy may be compromised. This is confirmed though recent work by Long (2000). He finds that omitted state characteristics can lead to substantial bias in the estimation of tax effects on charitable donations.

I study the relationship between marginal tax rates and Registered Retirement Savings Plan participation in Canada using repeated cross sections of the Family Expenditure Survey. Because RRSPs are discretionary individual accounts rather than employer-based plans, parallels with the IRA literature can be drawn. The identification of tax effects is provided by variation in marginal tax rates within provinces through time. This framework allows for provincial fixed effects, which may address the concerns raised by Long (2000). In addition, a polynomial term in income ensures that the tax rate does not simply pick up nonlinear effects of income on RRSP participation.

I then proceed to examine the relationship between marginal tax rates and RRSP participation in the period following the introduction of a carryforward mechanism. Starting in 1991, any unused RRSP contribution room in one year could be carried forward for use in future years. Milligan (forthcoming) shows that, under certain conditions, the carryforward will change the relationship between RRSP contributions and tax rates.<sup>5</sup> Specifically, with the carryforward in place, contributors will use RRSP contributions as a tax-smoothing mechanism. They will make bigger contributions in years with higher marginal tax rates and smaller contributions in years with lower marginal tax rates. I test this prediction by forecasting each taxpayer's future income and tax rates, and then using these variables to examine how taxpayer behaviour changed after the introduction of the carryforward.

The following results emerge. First, I find that marginal tax rates do influence the RRSP contribution decision, but that this influence is relatively small. The elasticity of participation with respect to changes in the marginal tax rate is estimated to be 0.283. This estimate is smaller than

 $<sup>^{4}</sup>$ Feenberg (1987) notes that there is a functional dependence between income and marginal tax rates which makes identification difficult in cross sectional regressions of the effects of marginal tax rates on charitable contributions. Triest (1998) updates and expands on the issues surrounding the identification of tax price effects.

<sup>&</sup>lt;sup>5</sup>The model assumes that the deduction for an RRSP contribution must be taken in the year the contribution is made. However, in reality, the deduction may be taken in the current year or in any future year. This feature of the RRSP system is not captured in the model. I address this issue further in Section 6.

previous estimates, however, and explains only 5.1 per cent of the trend in RRSP participation from 1982 to 1996. Second, I find evidence of a change in the relationship between RRSP contributions and marginal tax rates following the introduction of the carryforward mechanism. The evidence suggests that contributors became more sensitive to the timing of their contributions with the carryforward in place, which is consistent with theory.

The paper proceeds as follows. First, I present some relevant background information on Registered Retirement Savings Plans and the Canadian tax system. Second, there is a brief discussion of the empirical strategy employed in the estimation. The next section describes the construction of the data set, and presents some descriptive statistics. The main empirical results are then presented in Section 5, followed by the results on the effects of the carryforward. A brief discussion concludes the paper.

#### 2 Institutions

This section provides a brief overview of Canadian tax institutions, followed by some historical aggregate statistics on RRSP contributions. In Canada, tax is levied on income both by the federal and provincial governments.<sup>6</sup> With the exception of Quebec, these taxes are collected by the federal government through tax collection agreements with the provinces.<sup>7</sup> In these provinces during the time period covered by the data used here, tax was levied as a percentage of Basic Federal Tax, with each province free to set its own rate.<sup>8</sup> In addition, there are federal surtaxes (levied on Basic Federal Tax), provincial surtaxes and flat taxes (levied on provincial tax payable or on taxable income). This means that changes in these parameters across provinces. More detail on the magnitudes of these changes is provided in the next section.

Registered Retirement Savings Plans were introduced in 1957. Contributions are deductible from current income, and investment income accrues tax-exempt. Withdrawals are taxed as income in the year of withdrawal, and can be made without penalty.<sup>9</sup> Contribution limits are currently

<sup>&</sup>lt;sup>6</sup>More detail can be found in Boadway and Kitchen (1999).

 $<sup>^{7}</sup>$ Taxpayers in Quebec must fill in two tax forms — one for provincial income taxes and one for federal income taxes.

 $<sup>^8\</sup>mathrm{In}$  1996, these rates varied from 69% of Basic Federal Tax in Newfoundland to 45.5% in Alberta.

<sup>&</sup>lt;sup>9</sup>This is in contrast to withdrawals from Individual Retirement Accounts in the United States, which attract a ten percent penalty if made before age 59.5.

set at 18 per cent of earned income, to a maximum of \$13,500.<sup>10</sup> Members of employment-based pension plans (called Registered Pension Plans) have their limit reduced in recognition of the special tax benefit conferred on their employment pension. Appendix A outlines the details of the limit structure.

Figure 1 displays the participation rate from 1968 to 1996, along with the average contribution made by contributors.<sup>11</sup> Participation here is measured by the number of tax filers making a contribution divided by the number of tax filers with income from employment.<sup>12</sup> The average contribution is found by dividing total RRSP contributions in 1990 Canadian dollars by the number of RRSP contributors. Several interesting patterns are evident. The participation rate rises smoothly from 2.4 per cent in 1968 to 46.0 per cent in 1996. Through the same period, the average contribution falls through the 1970s, stays level through the 1980s, and then begins to increase in the 1990s. So, the growth in total RRSP contributions appears to be driven by an increase in the number of contributors rather than increasing contributions by contributors. The empirical work below will address how much of this upward trend in participation may be attributable to increases in marginal tax rates through this period.

#### 3 Empirical Strategy

I exploit variation in marginal tax rates through time and across provinces to identify the effect of taxes on RRSP participation. This variation is considerable in the 1982 to 1996 period, both across and within provinces. To describe the extent of this variation, Table 1 presents the marginal tax rates for each year and province for someone facing the top marginal tax rate.<sup>13</sup> The top marginal

<sup>&</sup>lt;sup>10</sup> Before 1990, earned income for RRSP purposes comprised the sum of T4 income, other employment income, Old Age Security pension income, Canada/Quebec Pension Plan income, other pension income, net rental income, net business income, net professional income, net farming income, and net fishing income. From 1990, the definition excluded Old Age Security pension income, Canada/Quebec Pension Plan income, and other pension income.

<sup>&</sup>lt;sup>11</sup>The data come from the annual *Tax Statistics on Individuals* publication of Revenue Canada.

 $<sup>^{12}</sup>$ The true participation rate would use the number of eligible taxfilers rather than those with income from employment. Before 1990, the definition of earned income for RRSP purposes was much broader. (See footnote 10 for further details.) After 1991, there may be taxfilers with no present income from employment who had unused contribution room from previous years. This suggests that the measure used here understates the number of eligible taxfilers, and so overstates the participation rate. Alternative definitions of RRSP eligibility lead to no qualitative change in the shape of the line in Figure 1.

 $<sup>^{13}</sup>$ Marginal tax rates for those earning more than \$100,000 are constant in all provinces and years considered here. There is also substantial variation across provinces and through time at lower income levels, so Table 1 does not present the full extent of the variation. As well, low and middle income earners may face higher marginal effective tax rates than high income earners because of income testing on refundable tax credits and the capped tax base of payroll taxes for unemployment insurance and the Canada/Quebec Pension Plan. (See, for example, Davies (1998).)

tax rate ranges from 46.1 per cent in Alberta for 1996 to 61.4 per cent for Quebec in 1982/1984. There is an obvious drop in top marginal tax rates between 1986 and 1990 across all provinces. This is a result of the federal tax reform of 1988, which dropped the federal tax rate in the top bracket from 34 percent to 29 percent. The other source of variation through time in the federal tax system is changes in federal surtaxes. In 1982, there were no federal surtaxes. By 1992, federal surtaxes added 2.8 percentage points to the top marginal tax rate. The other factors underlying the marginal tax rate changes in the Table are changes in provincial tax rates and surtaxes. For example, in Ontario, provincial taxes contributed 16.3 percentage points to the top marginal tax rate in 1982 and 21.6 points in 1996.

This variation serves two purposes. First, it allows the effects of taxes to be interpreted separately from income. Because taxes are a function of income, differences in the tax schedule through time and across provinces help to separate the effects of taxes from those of income. Second, the variation through time means that tax effects can be separated from jurisdictional fixed effects. This is important if, for example, there are fixed institutional factors within different provinces not captured in these data but relevant to RRSP participation decisions.

This strategy is similar in some respects to the approach in Veall (1999). He exploits the Canadian federal tax reform of 1988, which lead to large drops in marginal tax rates for higher income taxpayers. He finds a negative relationship between RRSP contributions and marginal tax rates, which is different from the rest of the literature. A potential explanation for his finding lies in the uniformity of the direction of changes in tax rates during the time period he studies. As can be seen in Table 1, marginal tax rates decreased in all provinces from 1986 to 1989. At the same time, however, there was a secular upward trend in RRSP participation throughout the 1980s. So, any effect of changes in the marginal tax rate may be overwhelmed by this underlying trend. Without an appropriate control group, the trend cannot be separated from the marginal tax rate effect.

In the time period I use, the marginal tax rates in different provinces are moving in different directions over the same period. For example, in Quebec the marginal tax rate falls between 1982 and 1992, before rising again for 1996. In contrast, Ontario's top marginal tax rate rises between 1982 and 1986, falls in 1990, then rises again. This variation will be crucial for identifying the effect of marginal tax rates on participation in the presence of the secular trend in RRSP participation.

#### 4 Data

I employ the Family Expenditure Survey (FAMEX) for the analysis of marginal tax rates and RRSP contributions. The FAMEX is a periodic cross-sectional survey of household characteristics and expenditure patterns. I use the years 1982, 1984, 1986, 1990, 1992, and 1996. The FAMEX is not a panel — each year of the survey covers a new set of families. The primary advantage of the FAMEX is its coverage of demographic and family characteristics. This allows the construction of many control variables that may influence the RRSP contribution decision, but are not available using data sets formed from administrative data drawn from tax records. The families being interviewed for the survey are encouraged to consult source documents when responding, and their answers are checked for internal consistency.

The rest of this section describes the construction of the data set used in the analysis, and then provides some descriptive statistics for the sample.

#### 4.1 Data set construction.

The construction of the working sample begins with the pooled observations from the six waves of the FAMEX. In order to maintain a consistent sample across years, households from outside major urban centres are removed.<sup>14</sup> Because of large differences in the labour-market activities of males and females, the focus for this analysis is solely on male-headed households.<sup>15</sup> My interest lies in the contribution behaviour of those who are accumulating funds in RRSPs, so those who have already retired should be excluded. I therefore impose a restriction of the age range to those between 19 and 59.<sup>16</sup> As well, only those who are eligible to contribute to an RRSP should be included. For this reason, anyone without income from wages and salaries is removed.<sup>17</sup> The final data set used in the analysis consists of 16,990 observations.

RRSP participation is defined as a family with a positive contribution to an RRSP. This defini-

<sup>&</sup>lt;sup>14</sup>The 1984 and 1990 surveys were conducted only in 15 large cities. For the other survey years, only those in cities with 100,000 or more in population.

<sup>&</sup>lt;sup>15</sup>The results on the impact of the carry-forward in Section 6 require consideration of the labour market behaviour of the head of household. This motivates the restriction of the sample to focus on male-headed households.

<sup>&</sup>lt;sup>16</sup>Regressions run on a data set containing those up to age 65 showed very similar results.

<sup>&</sup>lt;sup>17</sup>This definition excludes some individuals who may be eligible to contribute but do not have income from wages or salaries in the current year. For example, after 1991, the carryforward of unused room from previous years would allow someone without earned income to make a contribution. In addition, those with a substantial employment based pension plan may not have any RRSP contribution room left after the Pension Adjustment. These individuals would be counted here as eligible, but in fact are not eligible.

tion excludes those who are withdrawing from their RRSPs.<sup>18</sup> Those who participate under this definition are assigned *Contributor* equals one, and those not participating are assigned *Contributor* equals zero. The key explanatory variable of interest is the marginal effective tax rate (METR), which is created using a tax rate calculator.<sup>19</sup> I define the METR using a first-dollar marginal tax rate definition. That is, the METR assigned to the individual is the tax rate he or she faces on the first dollar of RRSP contribution. This is appropriate for the RRSP participation decision because I am interested in the binary participation decision rather than the decision about how much to contribute.<sup>20</sup> This calculation is performed both for the male and for his spouse, if he has one.

Along with the tax variables, I create several controls for other household characteristics that may influence decisions. These controls include variables for age, number of children, education, after tax income, marital status, the amount of housing equity, and participation in other forms of tax-preferred savings. The definitions for these variables appear in Appendix B.

#### 4.2 Descriptive Statistics

Some descriptive statistics for the sample are displayed in Table 2. For each cell, the mean is reported with the standard deviation in brackets beneath. Results for the full sample appear in the first column, and for two subsamples selected on RRSP contributor status in the next two columns. Overall, 32 per cent of the observations in the sample made a contribution to an RRSP. Comparing the RRSP contributors in the second column to the non-contributors in the third column yields several interesting observations. RRSP contributors are, on average, older, have higher income and housing wealth, are more likely to have at least some university education, and face higher marginal tax rates than non-contributors. A more precise exploration of the relationships between these characteristics and RRSP contribution behaviour is undertaken in the next section using

<sup>&</sup>lt;sup>18</sup>Poterba et al. (1999) study withdrawals from 401(k) plans. Frenken and Standish (1994) and Frenken (1996) present some aggregate statistics on RRSP withdrawals. Withdrawals are difficult to consider with this data set because the stock of accumulated RRSP contributions is not observed. This makes it impossible to determine for whom withdrawals are feasible. In the final data set, 2.7 per cent of the observations are observed to be making a withdrawal. Regressions run using a broader definition of participation that includes both those who are contributing and those who are withdrawing showed little difference for the *METR* coefficient.

<sup>&</sup>lt;sup>19</sup>Specifically, the calculator accounts for the basic, age, spouse, UI, and C/QPP deductions, credits, or amounts. Family allowance, child tax credit, child tax benefit, sales tax credit, and GST tax credit are assigned to families based on their observed incomes. Federal taxes, surtaxes, and payroll taxes, along with provincial taxes, surtaxes, and flat taxes are calculated. Provincial taxes for residents of Quebec are calculated using the corresponding parameters of the Quebec tax system.

<sup>&</sup>lt;sup>20</sup>Triest (1998) suggests that this variable is potentially endogenous if the levels of other deductions or income sources were affected by the RRSP participation decision. Because there are fewer discretionary deductions under the Canadian tax system, this is not as great a concern when considering Canadian data.

multivariate regressions.

#### 5 Evidence

This section presents a rigorous examination of the relationship between marginal tax rates and RRSP contributions. I provide evidence of two kinds. First, I find evidence of a positive relationship between marginal tax rates and participation rates by aggregating the data to province-year cells. Following this analysis, I explore regressions using several specifications on family level data.

#### 5.1 Province-Year Cells

To begin the exploration of the relationship between marginal tax rates and RRSP contributions, I examine the mean contribution rates and marginal tax rates in cells made up of those in each province in each year. The motivation for this analysis is to aggregate the data up to the level of the primary source of variation. To do this, I create a data set in which each observation corresponds to a province in a particular year. I implement this using the cell means of the observations from the FAMEX. This permits a preliminary look at how the variation in tax rates through time and across provinces influences RRSP contribution rates.

Figure 2 plots the means of the variables Contributor and METR for the province-year cells. I denote these cell mean variables  $\overline{Contributor}$  and  $\overline{METR}$ , to distinguish them from the underlying individual level variables. The plotted points are weighted by the number of observations in each cell.

The data appear in two clusters. For the main cluster on the left, there is a clear positive relationship between  $\overline{METR}$  and  $\overline{Contributor}$ . The second smaller cluster on the right consists of the six cells for the province of Quebec. These cells have higher average marginal tax rates, which is consistent with the high tax rates imposed on middle income earners in Quebec. However, these higher tax rates do not appear to lead to correspondingly higher contribution rates. This means that either the same relationship between tax rates and contributions does not hold in Quebec, or that there is a strong Quebec fixed effect in RRSP contributions.

This analysis is taken further in Table 3, which presents results of regressions on the cell-mean data set. In column (a), I report the result of a regression of  $\overline{Contributor}$  on  $\overline{METR}$ . The estimated coefficient of 1.606 is significantly different from zero, and implies that a 10 percentage point increase in the average marginal tax rate would increase RRSP participation by 16.06 percentage points.

In column (b), I include a Quebec fixed effect. This frees the six Quebec observations to have their own intercept, which aligns more closely with the patterns evident in Figure 1. With the Quebec fixed effect included, the coefficient becomes much larger, at 3.815. This suggests a strong positive relationship between the mean marginal tax rates and the mean contribution rates. The regression reported in column (c) augments the previous specification by adding fixed effects for all provinces, as well as dummies for each of the different years in the sample. Here, the effect of  $\overline{METR}$  on  $\overline{Contributor}$  is identified by within-province variation in the mean marginal tax rates. The estimated coefficient of 2.295 remains positive, large, and significant.

If the variation in marginal tax rates were exogenous, then the credibility of making a causal inference from this evidence would be strong. However, if changes in some other variable or characteristic influences both the variation in marginal tax rates and contribution decisions, then causal inferences from this evidence would be weaker. One obvious variable that could influence both contributions and taxes is income. For example, the variation in  $\overline{METR}$  might be driven by changes in income through "bracket creep." If a province experiences a shock to income, it is possible that participation would increase because of a higher desire for future consumption, and that the marginal tax rate would increase by moving on average to higher tax brackets. To account for the possibility that shocks to income may underlie the relationship between  $\overline{METR}$  and  $\overline{Contributor}$ , specification (d) in Table 3 includes  $\overline{Before tax income}$  in the regression. The coefficient on  $\overline{METR}$  and  $\overline{EfR}$  is possible that the movements in  $\overline{METR}$  are a result of changes in policy rather than a result of bracket creep through changes in income.

#### 5.2 Family-level Regression Results

In this section, I present regression results from the full microdata sample. These regressions take the form

$$Contributor_{i} = \beta_{0} + \beta_{1}METR_{i} + \beta_{2}'Year_{i} + \beta_{3}'Province_{i} + \beta_{4}'X_{i} + \varepsilon_{i}$$

The variables Contributor and METR are described above. The variables Year and Province are vectors of indicator variables for the year and province corresponding to a particular observation.

The vector X contains age, education, and other control variables, and  $\varepsilon$  is a mean zero disturbance term. The parameters  $\beta_0$  to  $\beta_4$  are estimated as a probit using the above equation. I begin by including only the marginal tax rate, then proceed to see how the estimated effect of taxes on RRSP participation changes with more control variables included.

The first regression reported in Table 4 includes only METR on the right-hand side. The estimated probit coefficient implies a marginal probability of 1.414, which is positive and significant at all conventional levels. This estimate can be interpreted to imply that a 10 percentage point increase in the marginal tax rate would increase the probability of RRSP participation by (1.414 \* 0.10) 14.1 percentage points. This represents 39.5 per cent of the baseline 35.8 percent probability of contributing. Evaluated at the mean of METR, this implies an elasticity with respect to the tax rate of 1.40. This is 34 percent larger than the biggest elasticity of 1.04 found by O'Neill and Thompson (1987). The second specification includes the year and province indicator variables. With these variables included, the estimated responsiveness of participation with respect to the marginal tax rate increases compared to the first specification, at 1.442. The year indicator variables show an underlying upward trend in participation through the sample period that cannot be explained by movements in marginal tax rates. Relative to the excluded Year 1982 variable, the probability of contributing in each of the other years is positive, reaching 0.222 for Year 1996. The inclusion of the province fixed effects does not change the results very much. This indicates that the within-province variation in taxes is sufficient to identify the tax rate effect. As well, although the provincial fixed effects are jointly significant, this suggests that they are not systematically correlated with METR and Contributor in ways that lead to bias if the provincial fixed effects were to be excluded. In other words, residents of provinces with high unobservable propensities to contribute do not appear to have systematically higher or lower tax rates.

By including the year and province indicators, this specification more closely resembles the regressions run by O'Neill and Thompson. The persistently larger effect found in these results compared to theirs may reflect differences in the tax treatment of IRAs and RRSPs. For example, funds withdrawn from IRAs before reaching age 59.5 attract a 10 percent penalty. With RRSPs, no such penalty exists, and this may influence the contribution decision relative to IRA contributors. Specifically, in the presence of the penalty, a contributor might resist contributing even in the presence of higher tax rates because of a preference for liquidity.

The third specification adds quartic terms in both the male's and his spouse's after tax income.<sup>21</sup> Because tax liabilities are a function of income, these controls for income allow the effect of taxes on contributions to be separated from that of income. Long (1988) shows that the addition of a quadratic term in income halves the estimated responsiveness of IRA contribution to the marginal tax rate using the same data and specification as O'Neill and Thompson. The specification in column (c) is similar to Long's, but uses a quartic instead of a quadratic in income. This allows for a richer control for nonlinear effects of income on participation. These new variables have a drastic impact on the magnitude of the estimated coefficient, which now is 0.249. This corroborates Long's finding that controlling for income is very important in participation regressions of this type.

The fourth column displays results from a regression including the full set of control variables. Here, the estimated coefficient on METR increases to a significant 0.286. The implied elasticity, evaluated at the means, is now 0.283. The magnitude of these elasticities suggests that contribution behaviour does respond in the expected way to marginal tax rates, but the reaction does not appear to be strong. The estimates suggest that a 10 percentage point increase in the marginal tax rate would increase the probability of participation by 2.8 percentage points, or about 8 per cent over the baseline 35.8 per cent participation rate.

To put this effect into a broader perspective, I look at the trends in contribution behaviour and in marginal tax rates over the period covered by this data set. The average marginal tax rate of individuals in the data set rose from 0.331 in 1982 to 0.385 in 1996. Over the same period, the proportion of individuals making contributions to RRSPs increased from 0.219 to 0.519. So, the estimate of 0.286 implies that 5.1 per cent (or 1.54 percentage points) of the 30 percentage point increase in RRSP participation is attributable to increases in marginal tax rates.<sup>22</sup>

Several other control variables included in specification (d) have interesting interpretations as well. To begin, there are some tax and savings related controls. The woman's marginal tax rate is

 $<sup>^{21}</sup>$ There was little difference for the coefficient on METR when income was entered as a quadratic or a quartic. The quartic was chosen to pick up any highly nonlinear effects of income on the contribution decision.

<sup>&</sup>lt;sup>22</sup>This calculation assumes a linear response in probability to a change in the marginal tax rate. In probit estimation, discrete changes in the value of an independent variable do not lead to linear response in probability. An alternative calculation was pursued on the 1996 observations as follows. First, the marginal tax rates for the male and female were calculated using 1982 tax parameters for observations from all years. This was combined with the estimated parameter on the marginal tax rate to calculate for each observation the predicted probability of contributing under the 1982 tax regime. The mean of these 1982 tax rate predicted probabilities can then be subtracted from the mean of the actual predicted probabilities to find the change in the mean probability of contributing attributable to the changes in tax rates. The result is a 1.58 percentage point increase in the probability of contributing, which is only slightly larger than the 1.54 calculated assuming a linear change.

not significant. This is not surprising, since the man's marginal tax rate exceeds the woman's in 79.1 per cent of the sample, and one would expect the higher of the two tax rates to be the relevant one for the RRSP participation decision. The annual contribution room exerts no significant effect on the contribution decision. If there were a fixed cost to participating (for example, the time it takes to establish an RRSP account), then larger available contribution room may induce more participation. These data do not support this hypothesis, however.

Three variables capture participation in other forms of tax-preferred savings. First, the estimated coefficient of 0.027 on RPP contributor indicates that those who make contributions to RPPs through their workplace are more likely to contribute to an RRSP than those who don't make contributions to RPPs. Second, the estimates suggest that those making contributions to RHOSPs are also more likely to contribute to RRSPs than those without RHOSP contributions. Finally, housing equity is estimated to have a strong positive influence on RRSP contributions. The estimated coefficient on *Housing equity* is 0.006 per one thousand dollars of housing equity, meaning that someone with \$100,000 in housing equity is 60 per cent more likely to contribute to an RRSP. None of these three savings related variables indicate that RRSPs are a substitute for other forms of tax-preferred savings. This is consistent with Venti and Wise (1988) who find that participation in an employment based pension increases the probability of participation in RRSPs. This suggests that RRSPs may not act as a substitute for other pension savings.<sup>23</sup>

Specification (d) also includes many demographic control variables. The quadratic in man's age indicates that the probability of contributing increases with age at an increasing rate. The effect of education on RRSP participation monotonically increases with education. This may capture differences in earnings potential or in preferences for savings. The presence of children in the household is estimated to make the family less likely to contribute to an RRSP. If families are liquidity constrained, then the extra expenditures necessary to raise children would leave less funds available for saving.

The analysis presented above produces two main findings. First, the evidence suggests that marginal tax rates do influence the decision to contribute to an RRSP. Second, the change in participation induced by the increase in marginal tax rates is estimated to be small when rich controls for income and other observable family characteristics are included.

 $<sup>^{23}</sup>$ See Bernheim (1999) for a review of the literature examining the degree to which savings in tax preferred savings plans offsets savings in other forms.

#### 6 Future Taxes

The models of Androkovich et al. (1992) and Milligan (forthcoming) describe how RRSP contributions can be used to smooth taxable income across years in order to minimize the individual's tax liability. This strategy suggests that contributors should contribute more in periods with higher tax rates, and less in periods with lower tax rates. Milligan's model predicts that the introduction of the RRSP carryforward mechanism should increase the contributor's desire to smooth taxable income through time. This prediction results from the diminution of the "use it or lose it" effect on contributions. Without a carryforward, contributors want to contribute more in early periods, in order to account for being constrained by contribution limits in future periods. This is the "use it or lose it" effect. When the carryforward is introduced, the "use it or lose it" motivation to contribute becomes less important, and taxpayers become concerned only with using their contribution to smooth their tax base through time. In other words, with a carryforward, the use of RRSPs as an income-averaging mechanism should increase.

This section addresses two questions related to this tax strategy. First, are taxpayers with higher future marginal tax rates less likely to contribute in the present period? Second, is there any evidence that the relationship between participation and future tax rates changed after the introduction of the carryforward in 1991? To find evidence on these questions, I make a projection of future income and future taxes for each taxpayer in the data set. I include these future income and tax variables in regressions similar to those presented in the previous section. Then, by interacting the future tax variable with an indicator for the period following the introduction of the carryforward, I can see if the data support the hypothesis that the carryforward enhances the desire of taxpayers to use RRSPs for income averaging.

An important caveat should be noted. Under the RRSP carryforward rules, the deduction from taxable income for a contribution need not be taken in the year of contribution, but may be taken in any future year. Because the year of contribution may be divorced from the year the deduction is taken, the actual contribution may be made without regard to tax smoothing considerations. If taxpayers were following this strategy, this would work against finding any evidence of increased tax-averaging after the introduction of the carryforward. However, the degree to which this feature of RRSPs is relevant may be brought into question. It is not clear that there is broad familiarity with this aspect of the RRSP system, and those who are aware may not take advantage of it.<sup>24</sup>

The empirical strategy requires a prediction of future income in order to find a projection of the future tax rate facing the household. To do this, I must find an instrument that can be used to predict income, but may be plausibly excluded from the RRSP contribution equation.<sup>25</sup> I use evidence of union membership for this purpose. Kuhn (1998) surveys the recent literature on the union wage effect, and concludes that there is "abundant and robust evidence that identical workers in North America earn about 15 per cent more in unionized than in non-unionized jobs." So, union membership should predict earnings. In addition, Lemieux (1998) shows that the union wage effect differs across industries and skill levels. With this in mind, I form a set of interaction variables between union membership and industry, education, and age variables. These variables will capture any differences between the earnings of union members and non-union members across industry, education, and age groups.

Is there any reason to believe that union membership influences the decision to contribute to an RRSP? If union members have a different age-earnings profile, then life-cycle savings patterns for union members and non-members could be different. To the extent that RRSP contributions represent savings level rather than savings allocation decisions, this may raise questions about the exclusion restriction. In addition, Morissette and Drolet (1999) provide evidence that union members are more likely to have RPPs through their employer than non-members. Because I can control for RPP contributions, this is only a concern if the RPPs provided by unionized environments differ systematically from those in non-unionized environments in a way that influences RRSP participation.

I run an earnings regression using the same set of explanatory variables in the specification in column (d) of Table 4, along with a set of instruments. The main instrument, *Union member*, is equal to 1 if the household reports paying any union dues in the survey year. This dummy variable is then interacted with the set of industry dummies, education dummies, and the age quadratic to form the set of instruments. In the earnings regression, this allows union members to have a different level of earnings by industry and skill group, as well as a different age-profile of earnings.<sup>26</sup> In order to predict future earnings, I increase the age variables by the desired number of years and

 $<sup>^{24}</sup>$ See National Post (2001) for an example of typical household financial advice which advises taxpayers to take deductions immediately.

<sup>&</sup>lt;sup>25</sup>Paxson (1992) and Card (1996) use instrumental variable strategies to project future income.

 $<sup>^{26}</sup>$  The *F*-statistic for the earnings regression is 123.79, and the set of instruments is jointly significant.

use the estimated coefficients to predict the earnings level corresponding to that future age. This future earnings level is then used to calculate the marginal tax rate that will face this taxpayer in the future year. The current year's tax parameters are used in this projection, so this assumes that the parameters of the tax system will stay constant in real terms for future years. The output of these estimations and calculations is the future income and future marginal tax rate for each man in the sample at any future age.

In Table 5, I present results of contribution regressions including the future income and future tax variables. The specification for these regressions is the same as in specification (d) of Table 4, with the addition of a quartic in future income along with the future marginal tax rate. The first two columns show the results for projections of income and taxes one year forward. The next two columns repeat the estimations for projections five years forward. The first column reports the basic results. Compared to Table 4, the coefficient on METR is now higher, at 0.315. The coefficient on Future METR is small, positive, and insignificant at conventional levels. The chi-squared test of the validity of the exclusion restriction on the instruments passes at the 95 per cent level.

The second column includes two extra variables in addition to those from the first column. First, a variable *Carryforward year* is set equal to 1 for years after 1991. (The dummy variable Year1996 now falls out of the regression to maintain full rank in the X matrix.) Second, the Carryforward year variable is interacted with Future METR in order to allow the future marginal tax rate to have a different effect on contribution behaviour after the introduction of the carryforward. In this specification, the coefficient on Future METR is now a significant 0.214. This estimate corresponds to the years before the carryforward was introduced. The coefficient on Carryforward year is positive and large, reflecting the underlying upward trend in RRSP participation in the 1990s relative to the 1980s. The interaction term Future METR\*Carryforward year has an estimated coefficient of -0.446. This implies that there was a drastic change in the influence of the future marginal tax rate on RRSP contributions after the introduction of the carryforward. When combined with the coefficient on the main effect of Future METR, this suggests that the future marginal tax rate has a marginal effect of -0.379. This means that those with higher future marginal tax rates were much less likely to contribute when the carryforward was operative. This is consistent with the tax base smoothing motivation for contribution — when there is a carryforward mechanism there is no "use it or lose it" motivation to contribute. This makes tax base smoothing more important than in a world without the carryforward.

#### 7 Conclusion

This paper has looked at marginal tax rates and the decision to contribute to RRSPs. I find a statistically significant effect of taxes on contributions, but the magnitude of this effect is small — a 10 percentage point increase in marginal tax rates is estimated to increase participation by about 8 per cent. This estimate of the magnitude of response to taxes can explain only five per cent of the increase in RRSP participation over the 1982 to 1996 period. I also find that there is little evidence of tax base smoothing affecting participation before the introduction of the RRSP carryforward, which may provide some further evidence for the "use it or lose it" model of contributions. After the introduction of the carryforward, I find evidence that participation may be influenced by tax base smoothing considerations. This suggests that the carryforward has changed how taxpayers make their RRSP contributions.

If increases in marginal tax rates cannot explain the increase in RRSP contributions, then what does? There are several possible explanations. The increase in RRSP participation may be explained by a desire to offset decreases in other sources of retirement income. For example, perceptions may have changed about the adequacy of future public pension benefits to meet the desired levels of retirement income. In addition, Morissette and Drolet (1999) document a decline in employer-provided pension coverage during the 1980s and 1990s. Broader RRSP participation may reflect either or both of these developments. A greater understanding of the factors contributing to the increase in RRSP participation remains a subject for future research.

### A Contribution Limit Regulations

#### A.1 Non-RPP Members

1972 - 1975	20% of earned income, to a maximum of \$4,000
1976 - 1985	20% of earned income, to a maximum of \$5,500
1986-1990	20% of earned income, to a maximum of \$7,500
1991	18% of earned income, to a maximum of \$11,500, with carryforward
1992 - 1993	18% of earned income, to a maximum of \$12,500, with carryforward
1994	18% of earned income, to a maximum of \$13,500, with carryforward
1995	18% of earned income, to a maximum of \$14,500, with carryforward
1996-2000	18% of earned income, to a maximum of \$13,500, with carryforward

#### A.2 RPP Members

1972 - 1975	20% of earned income, to a maximum of
	(\$2500  less employee contribution to RPP)
1976 - 1990	20% of earned income, to a maximum of
	(\$3500  less employee contribution to RPP)
1991	18% of earned income, to a maximum of
	(\$11,500 less pension adjustment), with carryforward.
1992 - 1993	18% of earned income, to a maximum of
	(\$12,500 less pension adjustment), with carryforward.
1994	18% of earned income, to a maximum of
	(\$13,500 less pension adjustment), with carryforward.
1995	18% of earned income, to a maximum of
	(\$14,500 less pension adjustment), with carryforward.
1996-2000	18% of earned income, to a maximum of
	(\$13,500  less pension adjustment), with carryforward.

#### **B** Variable definitions

Contributor: Takes the value 1 if change in RRSP is greater than zero; otherwise equal to 0.

Age: The age of the male in the household.

Age difference: The difference between the age of the female in the household and Age. Takes the value 0 if no female present.

Children: Number of children under the age of 18 present in the household.

Less than high school: Takes the value 1 if male did not receive high school diploma; otherwise equal to 0.

*High school*: Takes the value 1 if male received high school diploma, but no further education; otherwise equal to 0.

*Post-secondary*: Takes the value 1 if male pursued further education past high school, but did not receive university degree; otherwise equal to 0.

University degree: Takes the value 1 if male received university degree; otherwise equal to 0.

*Female less than high school*: Takes the value 1 if female did not receive high school diploma; otherwise equal to 0.

*Female high school*: Takes the value 1 if female received high school diploma, but no further education; otherwise equal to 0.

*Female post-secondary*: Takes the value 1 if female pursued further education past high school, but did not receive university degree; otherwise equal to 0.

*Female university degree*: Takes the value 1 if female received university degree; otherwise equal to 0.

*Married*: Takes the value 1 if female is legally married or in common-law relationship; otherwise equal to 0.

After-tax income: Male's after-tax income.

Female after-tax income: Female's after-tax income.

*METR*: Marginal effective tax rate of the male, accounting for provincial and federal income taxes and refundable tax credits.

*Female METR*: Marginal effective tax rate of the male.

*Family RRSP limit*: Current year's RRSP limit for the male plus current year's RRSP limit for the female. Calculated using reported earned income and RPP contribution.

*RPP Contributor*: Takes the value 1 if family made a Registered Pension Plan contribution; otherwise equal to 0.

*RHOSP Contributor*: Takes the value 1 if family made a Registered Home Ownership Savings Plan contribution; otherwise equal to 1.

Married: Takes the value 1 if male is married or has a common law partner.

#### References

- Androkovich, Robert A., Michael J. Daly, and Fadle M. Naqib (1992) 'The impact of a hybrid personal tax system on capital accumulation and economic welfare.' *European Economic Review* 36(4), 801–813
- Bernheim, Douglas (1999) 'Taxation and saving.' Working Paper 7061, National Bureau of Economic Research
- Boadway, Robin W., and Harry M. Kitchen (1999) Canadian Tax Policy (Toronto: The Canadian Tax Foundation)
- Canada, Revenue (various years) 'Tax statistics on individuals'
- Card, David (1996) 'The effect of unions on the structure of wages: A longitudinal analysis.' *Econometrica* 64(4), 957–979
- Collins, Julie H., and James H. Wyckoff (1988) 'Estimates of tax-deferred retirement savings behavior.' National Tax Journal 41(4), 561–572
- Davies, James B. (1998) 'Marginal tax rates in Canada: High and getting higher.' Commentary 103, C.D. Howe Institute
- Feenberg, Daniel (1987) 'Are tax price models really identified: The case of charitable giving.' National Tax Journal 40(4), 629–633
- Frenken, Hubert (1996) 'RRSP withdrawals revisited.' Perspectives on Labour and Income 8(4), 16–19
- Frenken, Hubert, and Linda Standish (1994) 'RRSP withdrawals.' Perspectives on Labour and Income 6(1), 37–40
- Hubbard, Glenn R. (1984) 'Do IRAs and Keoughs increase saving?' National Tax Journal 37(1), 43–54
- Kuhn, Peter (1998) 'Unions and the economy: What we know; What we should know.' Canadian Journal of Economics 31(5), 1033–1056
- Lemieux, Thomas (1998) 'Estimating the effects of unions on wage inequality in a panel data model with comparative advantage and nonrandom selection.' *Journal of Labor Economics* 16(2), 261–291
- Long, James E. (1988) 'Taxation and IRA participation: Re-examination and confirmation.' National Tax Journal 41(4), 585–589
- \_ (1990) 'Marginal tax rates and IRA contributions.' National Tax Journal 43(2), 143–153
- (1993) 'Estimates of the tax-favored retirement saving behaviour of the self-employed.' National Tax Journal 21(2), 163–167
- (2000) 'Omitted variables bias when using state tax prices to estimate the tax price effect on itemized deductions.' Public Finance Review 29(2), 120–133
- Milligan, Kevin S. (forthcoming) 'How do contribution limits affect contributions to tax-preferred savings accounts?' *Journal of Public Economics*

- Morissette, René, and Marie Drolet (1999) 'The evolution of pension coverage of young and primeaged workers in Canada.' Research Paper Series 138, Statistics Canada, Analytical Studies Branch
- National Post (2001) 'Don't wait to claim RRSP deduction.' March 1, p. D-4
- O'Neill, Cherie J., and Rodney Thompson (1987) 'Participation in individual retirement accounts: An empirical investigation.' *National Tax Journal* 40(4), 617–624
- Paxson, Christina H. (1992) 'Using weather variability to estimate the response of savings to transitory income in Thailand.' American Economic Review 82(2), 617–624
- Poterba, James M., Steven F. Venti, and David A. Wise (1999) 'Pre-retirement cashouts and foregone retirement saving: Implications for 401k asset accumulation.' Working Paper 7314, National Bureau of Economic Research
- Triest, Robert K. (1998) 'Econometric issues in estimating the behavioral response to taxation: A non-technical introduction.' *National Tax Journal* 51(4), 761–772
- United Kingdom (1999) 'Personal pension schemes.' Guidance Notes 76, Inland Revenue
- Veall, Michael (1999) 'Did tax flattening affect RRSP contributions?' Research Paper 3, SEDAP
- Venti, Steven F., and David A. Wise (1988) 'The determinants of IRA contributions and the effect of limit changes.' In *Pensions and the U.S. economy*, ed. Zvi Bodie and John B. Shoven (Chicago: University of Chicago Press)









1982	1984	1986	1990	1992	1996
0.541	0.544	0.583	0.493	0.505	0.533
0.518	0.519	0.558	0.495	0.507	0.503
0.532	0.532	0.571	0.503	0.507	0.503
0.529	0.538	0.576	0.487	0.505	0.513
0.614	0.614	0.603	0.505	0.510	0.530
0.503	0.520	0.554	0.483	0.498	0.529
0.560	0.561	0.599	0.504	0.508	0.504
0.534	0.534	0.581	0.498	0.516	0.520
0.471	0.471	0.527	0.464	0.467	0.461
0.505	0.511	0.557	0.463	0.498	0.542
	1982         0.541         0.518         0.532         0.529         0.614         0.503         0.560         0.534         0.471         0.505	1982       1984         0.541       0.544         0.518       0.519         0.532       0.532         0.529       0.538         0.614       0.614         0.503       0.520         0.560       0.561         0.534       0.534         0.471       0.471         0.505       0.511	1982198419860.5410.5440.5830.5180.5190.5580.5320.5320.5710.5290.5380.5760.6140.6140.6030.5030.5200.5540.5600.5610.5990.5340.5340.5810.4710.4710.5270.5050.5110.557	19821984198619900.5410.5440.5830.4930.5180.5190.5580.4950.5320.5320.5710.5030.5290.5380.5760.4870.6140.6140.6030.5050.5030.5200.5540.4830.5600.5610.5990.5040.5340.5340.5810.4980.4710.4710.5270.464	198219841986199019920.5410.5440.5830.4930.5050.5180.5190.5580.4950.5070.5320.5320.5710.5030.5070.5290.5380.5760.4870.5050.6140.6140.6030.5050.5100.5030.5200.5540.4830.4980.5600.5610.5990.5040.5080.4710.4710.5270.4640.4670.5050.5110.5570.4630.498

Table 1 METR variation

*Note:* Reported in each cell is the marginal tax rate at \$100,000 in the given year and province.

	All	Contributors	Non-contributors
n	16990	6082	10908
Contributor	0.358	1.000	0.000
	(0.479)	(0.000)	(0.000)
Age	38.8	41.2	37.4
	(9.91)	(9.57)	(9.82)
Age difference	2.147	2.032	2.215
	(4.435)	(4.136)	(4.618)
Children	0.931	0.893	0.952
	(1.05)	(1.029)	(1.065)
Housing equity	65583	92821	50396
	(83826)	(95876)	(71943)
Less than high school	0.075	0.051	0.089
	(0.264)	(0.221)	(0.284)
High school	0.408	0.319	0.457
	(0.491)	(0.466)	(0.498)
Some post-secondary	0.321	0.355	0.302
	(0.467)	(0.479)	(0.459)
University degree	0.196	0.274	0.152
	(0.397)	(0.446)	(0.359)
Female less than high school	0.071	0.040	0.089
	(0.283)	(0.212)	(0.318)
Female high school	0.460	0.391	0.501
	(0.583)	(0.547)	(0.602)
Female some post-secondary	0.334	0.381	0.305
	(0.537)	(0.543)	(0.530)
Female university degree	0.136	0.188	0.105
	(0.380)	(0.427)	(0.343)
After-tax income	30971	36957	27633
	(14444)	(14859)	(13067)
Female after-tax income	13873	17013	12019
	(14554)	(15591)	(13385)
METR	0.354	0.406	0.324
	(0.128)	(0.094)	(0.136)
Female METR	0.172	0.214	0.146
	(0.201)	(0.208)	(0.191)
Family RRSP limit	8503	10190	7562
	(4314)	(4405)	(3963)
RPP contributor	0.240	0.295	0.210
	(0.427)	(0.456)	(0.407)
RHOSP contributor	0.020	0.020	0.020
	(0.141)	(0.141)	(0.140)
Married	0.834	0.865	0.817
	(0.372)	(0.342)	(0.387)

Table 2 Summary Statistics

*Note:* Reported is the mean and standard deviation for each variable.

# Table 3Regression Results: Province-Year CellsDependent Variable: Mean of Contributor

	(a)	(b)	(c)	(d)
Mean of <i>METR</i>	1.606	3.815	2.295	2.098
	(0.520)	(0.340)	(0.377)	(0.430)
Mean of <i>Before tax income(\$10,000)</i>	**	**	**	0.026
				(0.030)
Quebec fixed effect	**	-0.298	-0.148	-0.140
		(0.034)	(0.031)	(0.032)
All provincial fixed effects	no	no	yes	yes
Year effects	no	no	yes	ves

*Note:* Reported are probit marginal probabilities. Robust standard errors are reported beneath parameter estimates. Regression on 16,990 observations.

	(a)	(b)	(c)	(d)
pseudo-Rsquared	0.0829	0.1218	0.1555	0.1803
METR	1.414	1.442	0.249	0.286
Year 1984	(0.041)	(0.044) 0.068	(0.089) 0.078	(0.102) 0.077
Year 1986		(0.014) 0.079 (0.015)	(0.015) 0.092 (0.015)	(0.015) 0.096
Year 1990		0.134	0.167	(0.010) 0.162 (0.017)
Year 1992		0.200	0.246	0.234
Year 1996		0.231	0.299	0.293
Age		(0.013)	(0.010)	-0.007 (0.004)
Age squared				0.000
Age difference				-0.005
Children				-0.021
Married				-0.076
Housing equity				0.006
High school				-0.032
Some post-secondary				0.024
University degree				0.033
Female high school				0.048 (0.021)
Female some post-secondary				0.065 (0.023)
Female university degree				0.058
RPP contributor				(0.027) 0.027 (0.011)
RHOSP contributor				0.157
Family RRSP limit				-0.006
Female METR				0.106

# Table 4Regression ResultsDependent Variable: Contributor

*Note:* Reported are probit marginal probabilities. Robust standard errors are reported beneath parameter estimates. Regression on 16,990 observations.

# Table 5Regression Results: Future TaxesDependent Variable: Contributor

	One year horizon		One year horizon Five year		r horizon	
	(a)	(b)	(c)	(d)		
METR	0.315	0.292	0.311	0.287		
	(0.104)	(0.104)	(0.104)	(0.104)		
Future METR	0.018	0.214	0.047	0.250		
	(0.134)	(0.152)	(0.140)	(0.155)		
Carrryforward Year	0.298	0.472	0.297	0.478		
	(0.018)	(0.051)	(0.018)	(0.055)		
Future METR * Carryforward Year	**	-0.446	**	-0.463		
		(0.133)		(0.142)		
Pseudo R-squared	0.183	0.183	0.183	0.183		
Overidentification test - Chi-squared	23.929	23.787	23.935	23.765		
p-value	0.121	0.125	0.121	0.126		

Note: These are probit marginal probabilities. Regression on 16,990 observations.

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