Tax-Sheltered Retirement Accounts: Can Financial Education Improve Decisions?

M. Martin Boyer Philippe d'Astous Pierre-Carl Michaud
HEC Montréal & Retirement and Savings Institute

April 2019

Tax-Sheltered Accounts

Two-types of accounts depending on the timing of taxation

- *Back*-loaded: Contribute pre-tax income and pay tax at withdrawal
  USA Traditional IRA/401(k); Canada RRSP

Tax-Sheltered Accounts

Two-types of accounts depending on the timing of taxation

- *Back*-loaded: Contribute pre-tax income and pay tax at withdrawal
  USA Traditional IRA/401(k); Canada RRSP
- *Front*-loaded: Contribute post-tax income and withdraw tax-free
  USA Roth IRA/401(k); Canada TFSA

Tax-Sheltered Accounts

Two-types of accounts depending on the timing of taxation

- *Back*-loaded: Contribute pre-tax income and pay tax at withdrawal
  USA Traditional IRA/401(k); Canada RRSP
- *Front*-loaded: Contribute post-tax income and withdraw tax-free
  USA Roth IRA/401(k); Canada TFSA

In Canada:

- $100 billion annual contributions (40% to RRSPs and 60% to TFSAs)

Tax-Sheltered Accounts

Two-types of accounts depending on the timing of taxation

- *Back*-loaded: Contribute pre-tax income and pay tax at withdrawal
  USA Traditional IRA/401(k); Canada RRSP
- *Front*-loaded: Contribute post-tax income and withdraw tax-free
  USA Roth IRA/401(k); Canada TFSA

In Canada:

- $100 billion annual contributions (40% to RRSPs and 60% to TFSAs)

What is the optimal account to contribute to?

- Understanding of marginal tax rates is key

Equivalence Result (MTR Rule)

EDU framework

If marginal tax rates are equal when contributing and withdrawing:
$\Rightarrow$ RRSPs and TFSAs generate the same CFs

- For example, MTR 50% and 3% real return over 35 years.
  Comparing *same out-of-pocket* cost:

	RRSP	TFSA
Contribution	2,000.00	1,000.00
Return	3,627.72	1,813.86
Withdrawal	2,813.86	2,813.86

Equivalence Result (MTR Rule)

EDU framework

If marginal tax rates are equal when contributing and withdrawing:
$\Rightarrow$ RRSPs and TFSAs generate the same CFs

- For example, MTR 50% and 3% real return over 35 years.
  Comparing *same out-of-pocket* cost:

	RRSP	TFSA
Contribution	2,000.00	1,000.00
Return	3,627.72	1,813.86
Withdrawal	2,813.86	2,813.86

It follows that, all else constant

- If MTR contribution $>$ MTR withdrawal $\Rightarrow$ RRSP
- If MTR contribution $<$ MTR withdrawal $\Rightarrow$ TFSA

Marginal Tax Rates

Mistakes can be costly

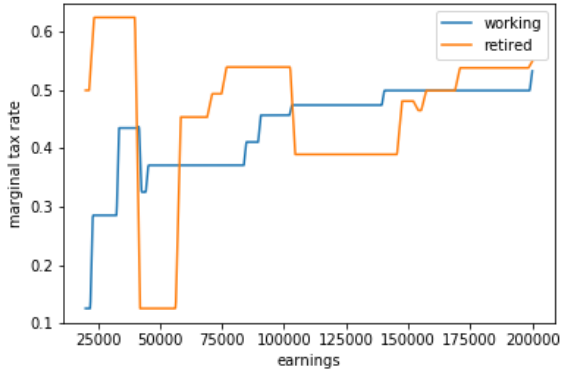


Figure: From SimTax: Single in Quebec, Ages 40 and 65, Retirement income 60% of earnings.

- In particular, aggressive clawbacks on Old Age Security/Income Supplement

The Role of Preferences

EDU framework

Agents might think of contribution amount and tax implications independently:

- Same pre-tax contributions following a change from back-loaded to front-loaded accounts (Beshears et al., 2015)

The Role of Preferences

EDU framework

Agents might think of contribution amount and tax implications independently:

- Same pre-tax contributions following a change from back-loaded to front-loaded accounts (Beshears et al., 2015)

For a fixed (pre-tax) contribution amount, we can show that:

- Risk/time preferences matter
- Back-loaded accounts are a good choice when
  - δ is low (i.e., the agent is impatient)
  - σ is low (i.e., the agent is risk tolerant)

The optimal decision rule becomes:

$$\phi^* = \mathbb{I}\left[\frac{\tau_1}{\tau_2} > R\delta\left(\frac{\overline{c}_1}{\overline{c}_2 + Rs}\right)^{\sigma}\right] \tag{1}$$

This Paper

Design experiment on choices between TFSA and RRSP contributions

This Paper

Design experiment on choices between TFSA and RRSP contributions

- Embed randomized financial education interventions on RRSP/TFSA:
  - Control: No intervention
  - Tax-arm treatment: Video defining RRSPs and TFSAs
    `https://www.youtube.com/watch?v=OnnCMrOu6Wg`
  - Means-testing arm treatment: Tax-arm video + Means-testing video
    `https://www.youtube.com/watch?v=UkS6ukBfjnA`

This Paper

Design experiment on choices between TFSA and RRSP contributions

- Embed randomized financial education interventions on RRSP/TFSA:
  - Control: No intervention
  - Tax-arm treatment: Video defining RRSPs and TFSAs
    `https://www.youtube.com/watch?v=OnnCMrOu6Wg`
  - Means-testing arm treatment: Tax-arm video + Means-testing video
    `https://www.youtube.com/watch?v=UkS6ukBfjnA`
- Measure the response on:
  - Knowledge of RRSPs and TFSAs
  - Optimal contribution choices to these accounts:
    Either using the MTR Rule, or taking into account preferences

Data

Asking Canadians:

- 3,005 respondents, age 35-55
- Detailed financial background information, financial literacy and socio-demographic characteristics ▸ Desc. Stats
- Measure time and risk preferences using Incentivized Multiple Price Lists (à la Andersen et al., 2009) ▸ View more

Effect on Knowledge of TFSAs and RRSPs

View questions Distribution of effect

	Contributions Deductible?	Withdrawals Taxed?	Returns Taxed?	Withdrawal Penalty?	Contribution Room?	Score/100
Means-testing arm	0.14***	0.14***	0.0014	-0.016	0.021	0.068***
	(0.020)	(0.019)	(0.022)	(0.017)	(0.019)	(0.015)
Tax arm	0.15***	0.15***	0.060***	0.0057	0.028	0.084***
	(0.020)	(0.019)	(0.022)	(0.017)	(0.019)	(0.014)
Control avg.	0.64	0.67	0.45	0.17	0.23	0.43
R^2	0.019	0.023	0.002	0.001	0.001	0.019
Observations	3,005	3,005	3,005	3,005	3,005	3,005

Table: **Is the answer to the question correct?** Possible answers: Only RRSP, Only TFSA, Both, None, DK/R. We report marginal effects after probit estimation of Y=1 if correct answer, 0 otherwise.

Contribution Choice Experiment

Stated choice experiment

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)
- Forced to invest in RRSPs or TFSAs (enough contribution room)

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)
- Forced to invest in RRSPs or TFSAs (enough contribution room)
- Withdraw at age 70 (payoff specified)

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)
- Forced to invest in RRSPs or TFSAs (enough contribution room)
- Withdraw at age 70 (payoff specified)
- Visual aids for marginal tax rates

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)
- Forced to invest in RRSPs or TFSAs (enough contribution room)
- Withdraw at age 70 (payoff specified)
- Visual aids for marginal tax rates

Repeated 6 times per respondent:
Returns = 2% or 5%, and
Retirement income = 50%, 100% or 200% of expected retirement income

Contribution Choice Experiment

Stated choice experiment

The context:

- Unexpected refundable tax credit ($1k, $2k, $5k, depending on income)
- Forced to invest in RRSPs or TFSAs (enough contribution room)
- Withdraw at age 70 (payoff specified)
- Visual aids for marginal tax rates

Repeated 6 times per respondent:
Returns = 2% or 5%, and
Retirement income = 50%, 100% or 200% of expected retirement income

Which account do you choose to contribute to?

Scenario example

Qid: iQ46TableON

For this question, suppose that before you receive the government's notice regarding your unexpected tax credit, your anticipated situation is as follows:

	In 2018	In 2049, at approximately 70 years old
Your total individual income	$100,000	$140,000
Your household's total income	$180,000	$260,000
Your household's total spending	$60,000	$260,000
Your individual Guaranteed Income Supplement benefits	-	$0
Your individual Old Age Security benefits	-	$4,058

The amount you will withdraw in 2049, at approximately 70 years old, will be of $22,690, which represents an average annual return of 5% on the $5,000 you receive in 2018. Taking into account all these elements, do you choose to invest the amount received in an RRSP or in a TFSA?

In an RRSP

In a TFSA

Effect on Contribution Choices

Distribution of effect

	Scn1	Scn2	Scn3	Scn4	Scn5	Scn6	Score
Case 1. MTR Rule							
Means-testing arm	0.13***	0.082***	0.049**	0.096***	0.10***	0.064***	0.087***
	(0.021)	(0.021)	(0.025)	(0.022)	(0.021)	(0.024)	(0.015)
Tax arm	0.015	0.0072	0.043*	0.035	0.0060	0.046*	0.024
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)	(0.025)	(0.015)
Control avg.	0.56	0.59	0.52	0.57	0.59	0.52	0.56
R^2	0.010	0.004	0.001	0.005	0.007	0.002	0.012
Observations	3.005	3.005	2.450	3.005	3.005	2.450	3.005
Case 2. Including Preferences							
Means-testing arm	0.079***	0.039	0.049*	0.12***	0.083***	0.081***	0.078***
	(0.024)	(0.024)	(0.027)	(0.023)	(0.023)	(0.026)	(0.015)
Tax arm	0.0091	−0.011	0.070***	0.048**	0.0043	0.039	0.026*
	(0.024)	(0.024)	(0.026)	(0.024)	(0.023)	(0.026)	(0.015)
Control avg.	0.54	0.52	0.51	0.55	0.58	0.52	0.54
R^2	0.004	0.001	0.003	0.008	0.005	0.003	0.011
Observations	2.597	2.597	2.130	2.597	2.597	2.130	2.597

Effect on Contribution Choices

▸ Distribution of effect

	Scn1	Scn2	Scn3	Scn4	Scn5	Scn6	Score
Case 1. MTR Rule							
Means-testing arm	0.13***	0.082***	0.049**	0.096***	0.10***	0.064***	0.087***
	(0.021)	(0.021)	(0.025)	(0.022)	(0.021)	(0.024)	(0.015)
Tax arm	0.015	0.0072	0.043*	0.035	0.0060	0.046*	0.024
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)	(0.025)	(0.015)
Control avg.	0.56	0.59	0.52	0.57	0.59	0.52	0.56
R^2	0.010	0.004	0.001	0.005	0.007	0.002	0.012
Observations	3.005	3.005	2.450	3.005	3.005	2.450	3.005
Case 2. Including Preferences							
Means-testing arm	0.079***	0.039	0.049*	0.12***	0.083***	0.081***	0.078***
	(0.024)	(0.024)	(0.027)	(0.023)	(0.023)	(0.026)	(0.015)
Tax arm	0.0091	−0.011	0.070***	0.048**	0.0043	0.039	0.026*
	(0.024)	(0.024)	(0.026)	(0.024)	(0.023)	(0.026)	(0.015)
Control avg.	0.54	0.52	0.51	0.55	0.58	0.52	0.54
R^2	0.004	0.001	0.003	0.008	0.005	0.003	0.011
Observations	2.597	2.597	2.130	2.597	2.597	2.130	2.597

Effect on Contribution Choices

Distribution of effect

	Scn1	Scn2	Scn3	Scn4	Scn5	Scn6	Score
Case 1. MTR Rule							
Means-testing arm	0.13***	0.082***	0.049**	0.096***	0.10***	0.064***	0.087***
	(0.021)	(0.021)	(0.025)	(0.022)	(0.021)	(0.024)	(0.015)
Tax arm	0.015	0.0072	0.043*	0.035	0.0060	0.046*	0.024
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)	(0.025)	(0.015)
Control avg.	0.56	0.59	0.52	0.57	0.59	0.52	0.56
R^2	0.010	0.004	0.001	0.005	0.007	0.002	0.012
Observations	3.005	3.005	2.450	3.005	3.005	2.450	3.005
Case 2. Including Preferences							
Means-testing arm	0.079***	0.039	0.049*	0.12***	0.083***	0.081***	0.078***
	(0.024)	(0.024)	(0.027)	(0.023)	(0.023)	(0.026)	(0.015)
Tax arm	0.0091	−0.011	0.070***	0.048**	0.0043	0.039	0.026*
	(0.024)	(0.024)	(0.026)	(0.024)	(0.023)	(0.026)	(0.015)
Control avg.	0.54	0.52	0.51	0.55	0.58	0.52	0.54
R^2	0.004	0.001	0.003	0.008	0.005	0.003	0.011
Observations	2.597	2.597	2.130	2.597	2.597	2.130	2.597

Effect on Contribution Choices

Distribution of effect

	Scn1	Scn2	Scn3	Scn4	Scn5	Scn6	Score
Case 1. MTR Rule							
Means-testing arm	0.13***	0.082***	0.049**	0.096***	0.10***	0.064***	0.087***
	(0.021)	(0.021)	(0.025)	(0.022)	(0.021)	(0.024)	(0.015)
Tax arm	0.015	0.0072	0.043*	0.035	0.0060	0.046*	0.024
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)	(0.025)	(0.015)
Control avg.	0.56	0.59	0.52	0.57	0.59	0.52	0.56
R^2	0.010	0.004	0.001	0.005	0.007	0.002	0.012
Observations	3.005	3.005	2.450	3.005	3.005	2.450	3.005
Case 2. Including Preferences							
Means-testing arm	0.079***	0.039	0.049*	0.12***	0.083***	0.081***	0.078***
	(0.024)	(0.024)	(0.027)	(0.023)	(0.023)	(0.026)	(0.015)
Tax arm	0.0091	−0.011	0.070***	0.048**	0.0043	0.039	0.026*
	(0.024)	(0.024)	(0.026)	(0.024)	(0.023)	(0.026)	(0.015)
Control avg.	0.54	0.52	0.51	0.55	0.58	0.52	0.54
R^2	0.004	0.001	0.003	0.008	0.005	0.003	0.011
Observations	2.597	2.597	2.130	2.597	2.597	2.130	2.597

Effect on Contribution Choices

Distribution of effect

	Scn1	Scn2	Scn3	Scn4	Scn5	Scn6	Score
Case 1. MTR Rule							
Means-testing arm	0.13***	0.082***	0.049**	0.096***	0.10***	0.064***	0.087***
	(0.021)	(0.021)	(0.025)	(0.022)	(0.021)	(0.024)	(0.015)
Tax arm	0.015	0.0072	0.043*	0.035	0.0060	0.046*	0.024
	(0.022)	(0.022)	(0.025)	(0.022)	(0.022)	(0.025)	(0.015)
Control avg.	0.56	0.59	0.52	0.57	0.59	0.52	0.56
R^2	0.010	0.004	0.001	0.005	0.007	0.002	0.012
Observations	3.005	3.005	2.450	3.005	3.005	2.450	3.005
Case 2. Including Preferences							
Means-testing arm	0.079***	0.039	0.049*	0.12***	0.083***	0.081***	0.078***
	(0.024)	(0.024)	(0.027)	(0.023)	(0.023)	(0.026)	(0.015)
Tax arm	0.0091	−0.011	0.070***	0.048**	0.0043	0.039	0.026*
	(0.024)	(0.024)	(0.026)	(0.024)	(0.023)	(0.026)	(0.015)
Control avg.	0.54	0.52	0.51	0.55	0.58	0.52	0.54
R^2	0.004	0.001	0.003	0.008	0.005	0.003	0.011
Observations	2.597	2.597	2.130	2.597	2.597	2.130	2.597

Welfare Loss from Mistakes

Conditional on Optimal Chocie

	(1)	(2)	(3)	(4)	(5)	(6)
Intervention						
(Control omitted)						
Means-testing arm	−194.5***	−185.1***	−193.5***	−181.7***	−183.3***	−186.0***
	(50.5)	(49.8)	(49.6)	(48.7)	(48.7)	(48.8)
Tax arm	−86.0*	−79.8	−82.4*	−84.2*	−84.8*	−83.9*
	(50.1)	(49.3)	(49.1)	(48.2)	(48.2)	(48.1)
Constant	690.8***	−206.7*	−936.4	−814.5	−886.7	−887.1
	(35.2)	(116.1)	(1254.1)	(1232.1)	(1232.1)	(1234.5)
Controls?						
Risk Preferences	NO	YES	YES	YES	YES	YES
Has RRSP/TFSA? and Age	NO	NO	YES	YES	YES	YES
Marital Status	NO	NO	NO	YES	YES	YES
Education	NO	NO	NO	NO	YES	YES
Financial Literacy	NO	NO	NO	NO	NO	YES
R^2	0.006	0.038	0.048	0.083	0.084	0.087

Table: **How much does the treatment reduce the welfare loss?**

Welfare Loss from Mistakes

Conditional on Optimal Chocie

	(1)	(2)	(3)	(4)	(5)	(6)
Intervention						
(Control omitted)						
Means-testing arm	−194.5***	−185.1***	−193.5***	−181.7***	−183.3***	−186.0***
	(50.5)	(49.8)	(49.6)	(48.7)	(48.7)	(48.8)
Tax arm	−86.0*	−79.8	−82.4*	−84.2*	−84.8*	−83.9*
	(50.1)	(49.3)	(49.1)	(48.2)	(48.2)	(48.1)
Constant	690.8***	−206.7*	−936.4	−814.5	−886.7	−887.1
	(35.2)	(116.1)	(1254.1)	(1232.1)	(1232.1)	(1234.5)
Controls?						
Risk Preferences	NO	YES	YES	YES	YES	YES
Has RRSP/TFSA? and Age	NO	NO	YES	YES	YES	YES
Marital Status	NO	NO	NO	YES	YES	YES
Education	NO	NO	NO	NO	YES	YES
Financial Literacy	NO	NO	NO	NO	NO	YES
R^2	0.006	0.038	0.048	0.083	0.084	0.087

Table: **How much does the treatment reduce the welfare loss?**

Welfare Loss from Mistakes

Conditional on Optimal Chocie

	(1)	(2)	(3)	(4)	(5)	(6)
Intervention						
(Control omitted)						
Means-testing arm	−194.5***	−185.1***	−193.5***	−181.7***	−183.3***	−186.0***
	(50.5)	(49.8)	(49.6)	(48.7)	(48.7)	(48.8)
Tax arm	−86.0*	−79.8	−82.4*	−84.2*	−84.8*	−83.9*
	(50.1)	(49.3)	(49.1)	(48.2)	(48.2)	(48.1)
Constant	690.8***	−206.7*	−936.4	−814.5	−886.7	−887.1
	(35.2)	(116.1)	(1254.1)	(1232.1)	(1232.1)	(1234.5)
Controls?						
Risk Preferences	NO	YES	YES	YES	YES	YES
Has RRSP/TFSA? and Age	NO	NO	YES	YES	YES	YES
Marital Status	NO	NO	NO	YES	YES	YES
Education	NO	NO	NO	NO	YES	YES
Financial Literacy	NO	NO	NO	NO	NO	YES
R^2	0.006	0.038	0.048	0.083	0.084	0.087

Table: **How much does the treatment reduce the welfare loss?**

Take-Away

- Knowledge of front- and back-loaded tax-sheltered accounts is limited

Take-Away

- Knowledge of front- and back-loaded tax-sheltered accounts is limited
- Choices close to random without intervention

Take-Away

- Knowledge of front- and back-loaded tax-sheltered accounts is limited
- Choices close to random without intervention
- A brief educational intervention was able to increase quality of choices by 10%

Take-Away

- Knowledge of front- and back-loaded tax-sheltered accounts is limited
- Choices close to random without intervention
- A brief educational intervention was able to increase quality of choices by 10%
- Measuring welfare effect of these products is important

Take-Away

- Knowledge of front- and back-loaded tax-sheltered accounts is limited
- Choices close to random without intervention
- A brief educational intervention was able to increase quality of choices by 10%
- Measuring welfare effect of these products is important

Theory

Go back

CASE 1. Perfect Adjustment / Marginal Tax Rate Rule

Agent chooses how much to contribute (s), and the share invested in RRSP (ϕ)

- Assume EDU agents under certainty, utility $u(\cdot)$ and discount factor δ

Agent chooses how much to contribute (s), and the share invested in RRSP (ϕ)

- Assume EDU agents under certainty, utility $u(\cdot)$ and discount factor δ

$$V(s,\phi) = u(y_1 - (1-\phi\tau_1)s) + \delta u(\psi y_1 + (1-\phi\tau_2)Rs) \tag{2}$$

Theory

Go back

CASE 1. Perfect Adjustment / Marginal Tax Rate Rule

Agent chooses how much to contribute (s), and the share invested in RRSP (ϕ)

- Assume EDU agents under certainty, utility $u(\cdot)$ and discount factor δ

$$V(s,\phi) = u(y_1 - (1-\phi\tau_1)s) + \delta u(\psi y_1 + (1-\phi\tau_2)Rs) \tag{2}$$

The optimal decision only depends on marginal tax rates:

Agent chooses how much to contribute (s), and the share invested in RRSP (ϕ)

- Assume EDU agents under certainty, utility $u(\cdot)$ and discount factor δ

$$V(s,\phi) = u(y_1 - (1-\phi\tau_1)s) + \delta u(\psi y_1 + (1-\phi\tau_2)Rs) \tag{2}$$

The optimal decision only depends on marginal tax rates:

$$R\delta s u_2' \left[\frac{\tau_1 - \tau_2}{1-\tau_1\phi}\right] = \lambda_2 - \lambda_1 \tag{3}$$

where λ_1 is the KT multiplier for $\phi \geq 0$ and λ_2 for $\phi \leq 1$.

Theory

Go back

CASE 1. Perfect Adjustment / Marginal Tax Rate Rule

Agent chooses how much to contribute (s), and the share invested in RRSP (ϕ)

- Assume EDU agents under certainty, utility $u(\cdot)$ and discount factor δ

$$V(s,\phi) = u(y_1 - (1-\phi\tau_1)s) + \delta u(\psi y_1 + (1-\phi\tau_2)Rs) \tag{2}$$

The optimal decision only depends on marginal tax rates:

$$R\delta s u_2' \left[\frac{\tau_1 - \tau_2}{1-\tau_1\phi}\right] = \lambda_2 - \lambda_1 \tag{3}$$

where λ_1 is the KT multiplier for $\phi \geq 0$ and λ_2 for $\phi \leq 1$.

$\Rightarrow$ **Hence invest in TFSA ($\phi = 0$) if $\tau_1 < \tau_2$ and in RRSP $\phi = 1$ if $\tau_1 > \tau_2$.**

Theory

Go back

CASE 2. Imperfect Adjustment / Fixed s

The agent's utility from a back-loaded account is

$$V(s,1) = u(\overline{c}_1 + \tau_1 s) + \delta u(\overline{c}_2 + (1-\tau_2)Rs), \tag{4}$$

and the utility from a front-loaded account is

$$V(s,0) = u(\overline{c}_1) + \delta u(\overline{c}_2 + Rs). \tag{5}$$

And the agent chooses

$$\phi^* = I\left[V(s,1) > V(s,0)\right]. \tag{6}$$

Taking a first order Taylor expansion of $V(s,1) - V(s,0)$, with utility fct $u(c) = c^{1-\sigma}/(1-\sigma)$, gives the approximate decision rule:

$$\phi^* = I\left[\frac{\tau_1}{\tau_2} > R\delta\left(\frac{\overline{c}_1}{\overline{c}_2 + Rs}\right)^{\sigma}\right] \tag{7}$$

Hence, back-loaded is a good choice when δ is low and σ is low.

Mistakes can be Costly

Go back

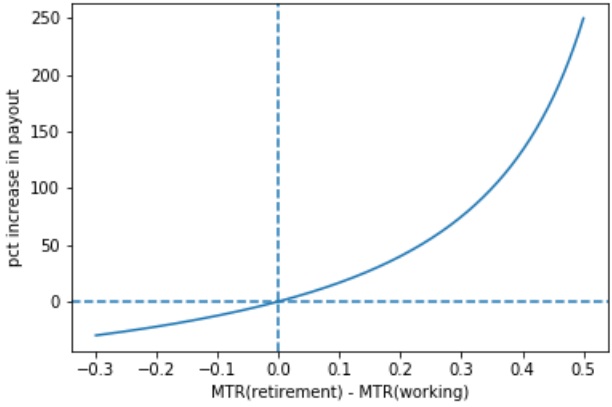


Figure: The loss from picking RRSP over TFSA as a function of the difference in marginal tax rates. Annual real return of 3%.

Descriptive Statistics I

Go back

	Sample	Diff. w/ control (std. err.)	
	Mean (std. dev.)	Means-testing arm	Tax arm
A. Demographics			
Age	44.43	0.18	0.19
	(6.26)	(0.28)	(0.27)
Male (%)	45.70	-0.49	-1.89
		(2.23)	(2.22)
Married or common-law (%)	61.39	-0.70	-1.24
		(2.15)	(2.14)
Widowed, separated or divorced (%)	11.10	1.53	0.64
		(1.40)	(1.42)
Never married (%)	27.51	-0.83	0.60
		(1.94)	(1.92)
High school or less (%)	62.42	-1.28	0.80
		(1.80)	(1.76)
College or some university (%)	14.46	3.31	0.84
		(2.08)	(2.09)
Bachelor degree or more (%)	23.11	-2.03	-1.64
		(2.23)	(2.22)

Descriptive Statistics II

Go back

	Sample	Diff. w/ control (std. err.)	
	Mean (std. dev.)	Means-testing arm	Tax arm
B. Income and Savings			
Annual income ('000 $)	61.59	1.98	-0.27
	(55.43)	(2.41)	(2.44)
Annual spending ('000 $)	75.29	-5.15	-15.32*
	(185.42)	(8.05)	(8.65)
Has RRSP (%)	59.70	-3.67*	-4.31**
		(2.03)	(2.02)
RRSP amount ('000 $)	100.83	20.76	19.11*
	(246.95)	(12.89)	(11.34)
Has TFSA (%)	49.44	1.20	-4.31**
		(2.21)	(2.19)
TFSA amount ('000 $)	23.50	1.57	2.38
	(31.48)	(2.26)	(2.14)
Has TFSA and RRSP (%)	39.55	0.68	-4.42**
		(2.22)	(2.22)

Descriptive Statistics III

Go back

	Sample	Diff. w/ control (std. err.)	
	Mean (std. dev.)	Means-testing arm	Tax arm
C. Financial Literacy			
1 correct answer (%)	15.97	-1.50	0.46
		(1.36)	(1.30)
2 correct answers (%)	29.55	-3.10	0.67
		(1.94)	(1.89)
3 correct answers (%)	46.80	4.26*	-1.84
		(2.19)	(2.16)
D. Preferences			
σ	0.43	0.01	-0.01
	(0.94)	(0.04)	(0.04)
β	0.97	0.01	0.01
	(0.21)	(0.01)	(0.01)

Risk Preferences

Go back

Step 1: MPL for risk preference:

	p_A	$w_{A,1}$	1-p_A	$w_{A,2}$	Ew_A	p_B	$w_{B,1}$	1-p_B	$w_{B,2}$	Ew_B	$\sigma_{\min}$	$\sigma_{\max}$
1	0.1	20.0	0.9	16.0	16.4	0.1	39.0	0.9	1.0	4.8	$-\infty$	-1.672
2	0.2	20.0	0.8	16.0	16.8	0.2	39.0	0.8	1.0	8.6	-1.672	-0.916
3	0.3	20.0	0.7	16.0	17.2	0.3	39.0	0.7	1.0	12.4	-0.916	-0.462
4	0.4	20.0	0.6	16.0	17.6	0.4	39.0	0.6	1.0	16.2	-0.462	-0.122
5	0.5	20.0	0.5	16.0	18.0	0.5	39.0	0.5	1.0	20.0	-0.122	0.164
6	0.6	20.0	0.4	16.0	18.4	0.6	39.0	0.4	1.0	23.8	0.164	0.426
7	0.7	20.0	0.3	16.0	18.8	0.7	39.0	0.3	1.0	27.6	0.426	0.689
8	0.8	20.0	0.2	16.0	19.2	0.8	39.0	0.2	1.0	31.4	0.689	0.981
9	0.9	20.0	0.1	16.0	19.6	0.9	39.0	0.1	1.0	35.2	0.981	1.376
10	1.0	20.0	0.0	16.0	20.0	1.0	39.0	0.0	1.0	39.0	1.376	∞

Table: **Multiple Price List of Lotteries**: Each respondent is presented with two lotteries A and B, with probabilities p_J of obtaining $w_{J,1}$ and $1 - p_J$ of obtaining $w_{J,2}$ for $J = A, B$. We also report the expected value of each lotteries Ew_J for $J = A, B$ and the bounds on σ compatible with a switch from A to B for a particular lottery.

Risk Preferences

Go back

Step 2: Estimate a ordered model and compute posterior mean.

	point estimate	standard error
age (z)	-0.023	0.018
male	-0.071	0.037
married	0.013	0.038
some college	-0.059	0.053
college	-0.092	0.051
quebec	0.039	0.036
FL 3 correct	-0.022	0.039
constant	0.483	0.056
η	0.899	0.015

Table: **Parameter Estimates of the Ordered Probit for σ:** We report parameter estimates β and η obtained by maximum likelihood using the BFGS algorithm. Standard errors obtained using the inverse Hessian of the log-likelihood.

Time Preferences

Go back

Step 3 and 4: MPL for time preference using risk aversion estimates, $\beta_j = \frac{c_A}{c_B}^{1-\sigma}$.

	point estimate	se
age (z)	0.010	0.005
male	-0.034	0.010
married	-0.001	0.010
some college	-0.004	0.015
college	-0.004	0.014
quebec	0.005	0.010
FL 3 correct	0.050	0.011
constant	0.925	0.016
η	0.211	0.005

Table: **Parameter Estimates of Ordered Probit for Time MPL**: We report parameter estimates β and η obtained by maximum likelihood using the BFGS algorithm. Standard errors obtained using the inverse Hessian of the log-likelihood. age (z) refers to the standardized z score of age.

Time and Risk Preferences

Go back

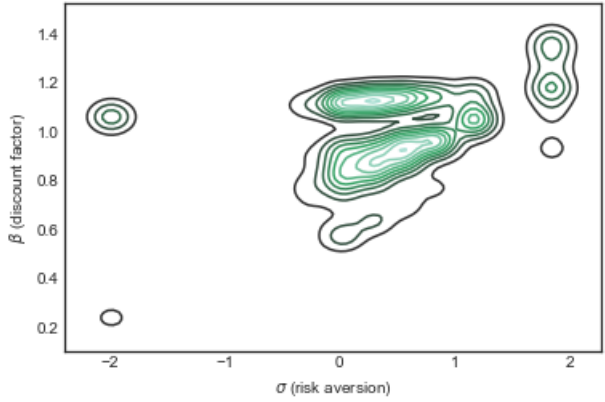


Figure: Distribution of individual imputed estimates of risk aversion and time preference.

Knowledge Questions

Go back

1. According to you, are the contributions made to an RRSP or to a TFSA deductible from taxable income?
2. According to you, when money is withdrawn from an RRSP or from a TFSA, is it subject to income tax in the year of the withdrawal? Assume the withdrawn amount is not used for the Home Buyers Plan (HBP) or the Lifelong Learning Plan (LLP).
3. Money invested in an RRSP or in a TFSA can generate returns in the form of interest, dividends or capital gains. According to you, are these returns subject to income tax in the year during which they were generated?
4. According to you, is there a penalty associated with withdrawing money from an RRSP or from a TFSA before retirement? Assume the withdrawn amount is not used for the Home Buyers Plan (HBP) or the Lifelong Learning Plan (LLP).
5. Lets assume you withdraw $1,000 from an RRSP or from a TFSA. According to you, will this withdrawn amount be added to your future contribution room?

Introductory Text

Suppose that in October 2018, the government of Canada informs you that you will be eligible to a one-shot, unexpected refundable tax credit worth $X, which you will receive that same month. However, the government forces you to invest the entire amount either in an RRSP or in a TFSA, and to incur in 2018 any tax implication of this new contribution. In both cases, suppose that you will have to withdraw the entire amount accumulated thanks to this new contribution in [2018+70-QB], at approximately 70 years old, and that the withdrawn amount will not be eligible to pension income splitting.

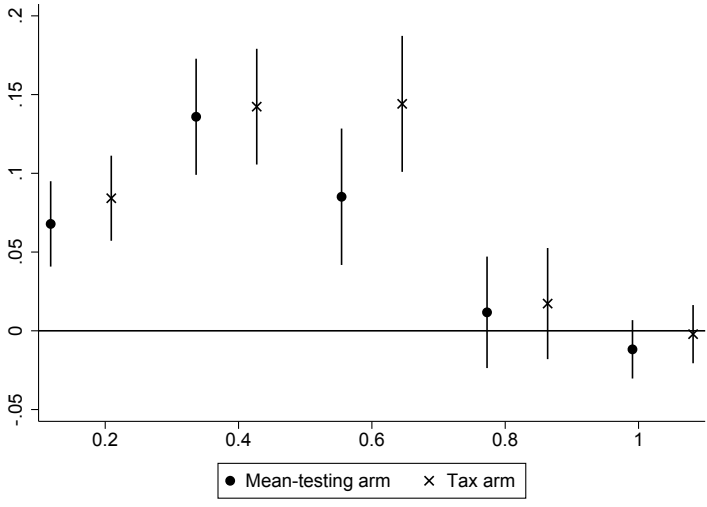
Finally, suppose that your contribution room is high enough to allow you to contribute the entire amount to either an RRSP or a TFSA; that there is no inflation; and that your marital status stays the way you told us it currently is.

The following questions present hypothetical changes to your personal situation as well as to the rate of return you will obtain with certainty on your new investment in an RRSP or a TFSA.

Treatment Effect Distribution

Go back

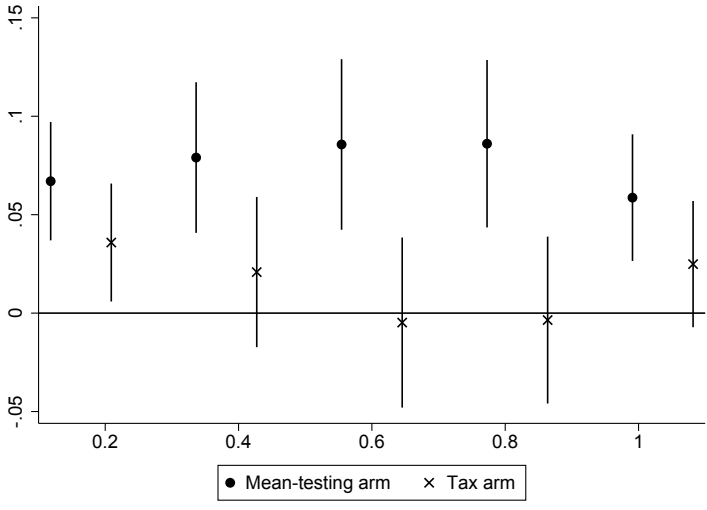
Knowledge Score



Treatment Effect Distribution

Go back

Contribution Choice



Welfare Loss Conditional on Optimal Choice

Go back

	(1)	(2)	(3)	(4)	(5)	(6)
A. RRSP is optimal						
Intervention						
(Control omitted)						
Means-testing arm	50.6	40.8	39.7	-37.4	53.8	75.7
	(39.3)	(31.6)	(55.6)	(60.5)	(54.5)	(67.6)
Tax arm	-9.12	12.9	-83.7	-56.1	34.3	24.5
	(39.2)	(30.4)	(54.7)	(60.9)	(54.0)	(65.2)
B. TFSA is optimal						
Intervention						
(Control omitted)						
Means-testing arm	-212.4***	-50.3	-223.0**	-364.2***	-202.7**	-394.4***
	(72.9)	(96.3)	(89.1)	(93.2)	(86.1)	(137.3)
Tax arm	-97.2	-46.7	-142.7	-139.6	-1.43	-176.0
	(71.9)	(96.4)	(88.0)	(91.7)	(85.0)	(135.9)

Table: **Welfare Loss (in $) by Optimal Contribution**: This table reports OLS regressions of the welfare loss, computed from the utility specification in the text, depending on the optimal contribution. ***, **, and * represent significance at the 1, 5 and 10 percent level, respectively.