An economic analysis of proposals to improve coverage of longevity risk

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Retirement Preparation and Longevity Risk

- Two key trends have created a renewed interest for pension reform
  - We are living longer
  - Employers are moving away from traditional defined-benefit plans
- Leaves households to
  - Define contributions
  - Manage financial risk
  - Manage longevity risk
Reform Options on the Table

• Two broad families of proposals:
  – Increase the generosity of earnings-related CPP/QPP public pensions (D’Amours, Mintz-Wilson and Wolfson)
  – Increase savings through voluntary tax-favored schemes (TFSA, RRSP and VRSP-RVER/PRPP) and promote the private market for annuities

• From the point of view of households, evaluating the return of these options involves taking into account:
  – Differences in mortality risk
  – Effects of tax system, including means-tested transfers
Our Goals

• Evaluate the internal rate of return (IRR) of these options for various types of households considering
  – uncertain life-cycle evolution of earnings
  – differences in mortality risk
  – interactions with the tax and transfer system
• Using data from Statistics Canada (SLID, NPHS) and a tax and transfer FORTRAN calculator developed by our team (SimTax)
Trend in Life Expectancy at 65

Source: HMD Mortality.org Period life tables for Canada, males and females
Differential Mortality
Life Expectancy at Age 25

Evidence that gap has increased over time and could widen in future

Sources: NPHS 1994-2012 and HMD 2012
Earnings Over the Life-cycle

• We use dynamic econometric models estimated on SLID data
• Earnings hump-shaped, more highly so for highly educated
• Highly persistent earnings shocks
• Work from 25 till 65, single, no children
The Canadian Public Pension System

- Old Age Security (OAS) pension: fixed first-tier benefit financed through tax revenue, means-tested at income beyond $71,000. Pays out a maximum, taxable benefit of $6,700 as of September 2014.

- Guaranteed Income Supplement (GIS): supplementary benefit, means-tested beyond $3,500 of employment income. Pays out a maximum, non-taxable benefit of $9,100 as of September 2014, and runs out at $16,900 of income (other than OAS & GIS).

- Canada/Quebec Pension Plan (CPP/QPP): earnings-based system that replaces up to 25% of career average earnings and financed by worker-employer contributions. Covered earnings capped at maximum pensionable earnings (MPE) of $52,500 in 2014.
Private Pension Income

• Other savings include: employer pension income, annuities, etc

• We estimate replacement rates using panel structure of SLID

• Lines up relatively well with Statistics Canada reports using admin data
After-Tax (Net) Replacement Rates Under the Reference Scenario

Average annual earnings between age 25 and 64 (thousands of $)
Effective Marginal Tax Rates (EMTR) : Reference

Differences in EMTR pre-post retirement not large

GIS is major component of EMTR in retirement
CPP/QPP-Based Reform Options

- The "D’Amours Proposal": introduces an additional earnings-based benefit (+20%) at age 75 financed by worker-employer contributions (3.3%)
- The "Mintz-Wilson Proposal": increases generosity of CPP/QPP to 35% instead of 25%, financed by additional worker-employer contributions (+2.5%)
- The "Wolfson Proposal": doubles the MPE (to around $100,000), adds a new 15% benefit for earnings between between 50% and 200% of current MPE. Financed by additional worker-employer contributions (+3.1% for 50%-100% current MPE; +8.3% up to 200% MPE)
At 75 only...
The wedge...
Other Voluntary Savings Options

- Pooled Registered Pension Plans (PRPPs): In Quebec, set up as "VRSPs". Starting in 2016, every employer will have to offer a tax-favored plan (RPP or VRSP). Default enrollment. Workers’ default contribution rate is 2% and employers can elect to contribute. EET treatment of savings (as for RRSPs).
- Tax-Free Savings Accounts (TFSAs): Workers can contribute up to $5,500 per year. Here 2%. TEE treatment.
- Savings accumulated under both options can then be used to buy an annuity in the marketplace.
Annuity Prices from CANNEX

• Using mortality tables and a 3% discount rate, we obtain the following fair payouts:
  – Less than HS = $7,237 (+14%)
  – HS = $6,627 (5%)
  – College = $6,239 (-1%)

• Average male/female for market = $6316
Effects on Net Replacement Rates at 75 CPP/QPP-Based Options

![Graph showing effects on net replacement rates]

- **GIS**
- Gradual exposure to wedge

**Axes:**
- Y-axis: Increase in net replacement rate (% pils.)
- X-axis: Average annual earnings between age 25 and 64 (thousands of $)

**Legend:**
- d'amours
- mintz-wilson
- wolfson
Effects on Net Replacement Rates at 75 y.o. – Voluntary Savings Options

- TFSA = higher sacrifice while working, larger rep rate than VRSP
- VRSP affected by GIS
Internal Rate of Return Calculation

• For each type of worker, we simulate a large number of income histories accounting for uncertainty in earnings and mortality under each scenario

• We compute numerically the discount rate needed to make the net present value of the changes in net income brought about by a given reform scenario equal to zero
IRR for CPP/QPP-based Options – D’Amours

![Graph showing the internal rate of return (IRR) for CPP/QPP-based options based on average annual earnings between age 25 and 64 (in thousands of $). The graph includes lines for No HS, HS, and University education levels, with annotations for GIS and Diff mortality.](image-url)
IRR for CPP/QPP-based Options – Mintz-Wilson

![Graph showing internal rate of return (IRR) for different educational attainment levels (No HS, HS, University) based on average annual earnings between age 25 and 64 (in thousands of $). The graph indicates the impact of GIS and Exemption on the IRR.]
Non-linearity of contribution rates + GIS
Voluntary Savings Options – VRSP

After-tax IRR not larger than pre-tax

GIS + Diff in METR

Internal rate of return (%) vs. Average annual earnings between age 25 and 64 (thousands of $)

- No HS
- HS
- University
Voluntary Savings Options – TFSA

Differential mortality

Average annual earnings between age 25 and 64 (thousands of $)

No HS  HS  University
In a World Without GIS...

Rates for individuals without high school diploma

Effects large for low earners, only TFSA not affected
Conclusions: Elements to Consider

• After accounting for taxes, net income replacement appears higher than often reported.
• The desirability of CPP/QPP-based options – which impose mandatory new contributions – is hampered by the GIS clawback, and to a lesser extent by differential mortality.
• Given the relatively flat age structure of METRs, new VRSP/RRSP contributions, particularly for lower earners, yield poor returns.
• The use of a TFSA coupled with an annuity provides a return that dominates that of many other options in the first tier of the earnings distribution.