C.I.R.P.É.E
Centre Interuniversitaire sur le Risque, les Politiques Économiques et l'Emploi

Chaire de recherche Industrielle Alliance sur les enjeux économiques des changements démographiques
CEDIA.ca

CIRANO
Allier savoir et décision
Centre interuniversitaire de recherche en analyse des organisations

An economic analysis of proposals to improve coverage of longevity risk

Jean-Yves Duclos (U Laval)

in collaboration with

David Boisclair (ESG UQAM), Steeve Marchand (U Laval) and Pierre-Carl Michaud (ESG UQAM)

CEA, Ryerson University, Toronto, 30 May 2015

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

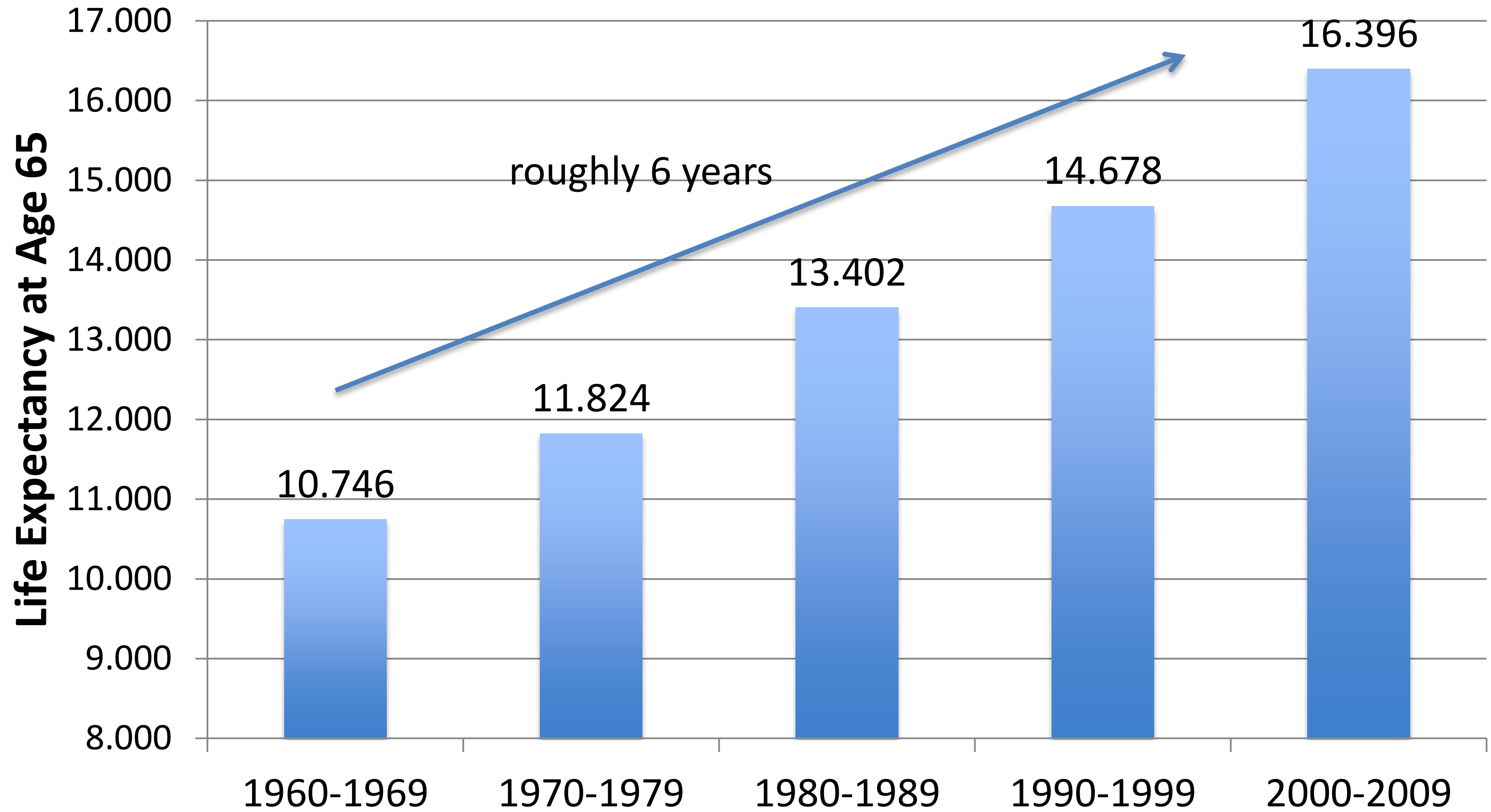
- Two broad families of proposals:
  – Increase the generosity of earnings-related CPP/QPP public pensions (D'Amours, Mintz-Wilson and Wolfson)
  – Increase savings trough voluntary tax-favored schemes (TFSA, RRSP and VRSP-RVER/PRPP) and promote the private market for annuities

- 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

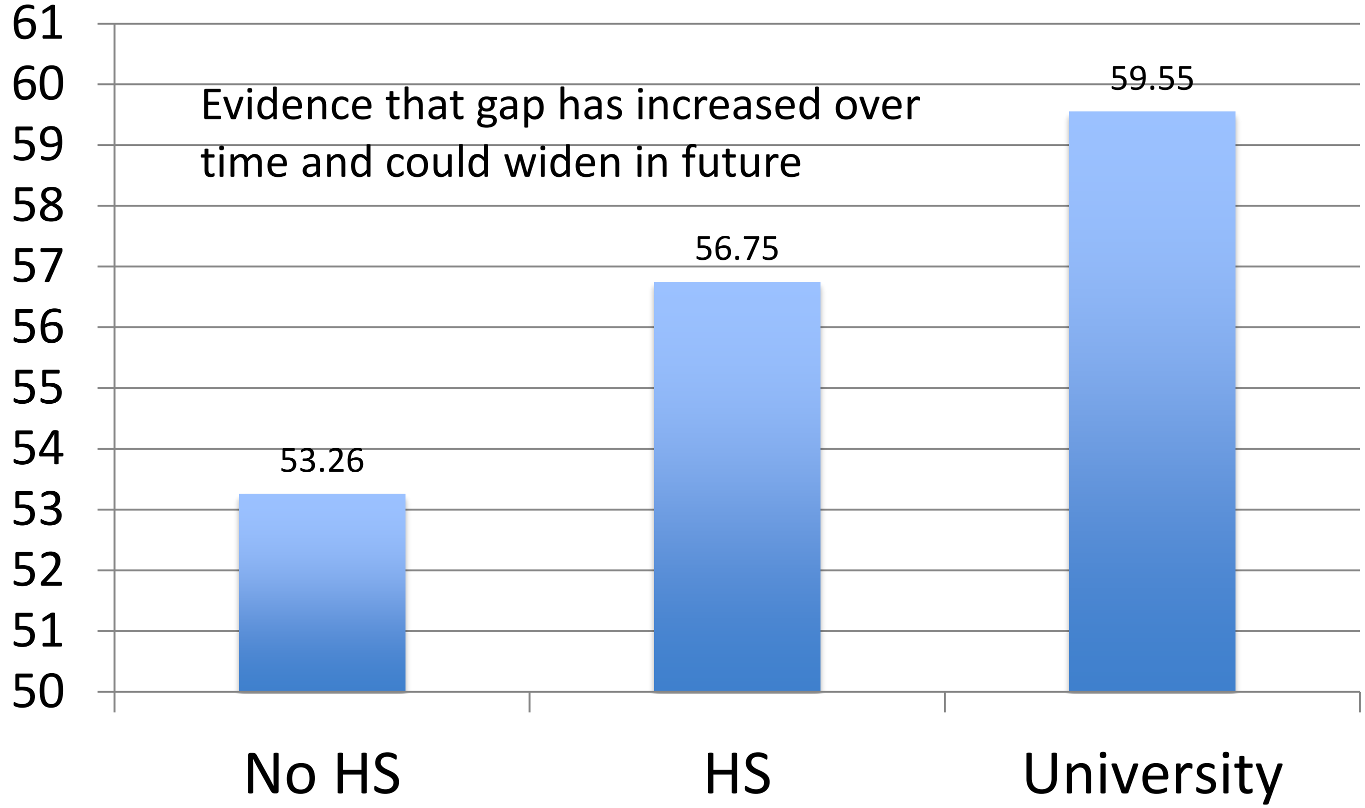
- Evaluate the internal rate of return (IRR) of these options for various types of households considering
  - uncertain life-cycle evolution of earnings
  - differences in mortality risk
  - interactions with the tax and transfer system
- Using data from Statistics Canada (SLID, NPHS) and a tax and transfer FORTRAN calculator developped 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



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.

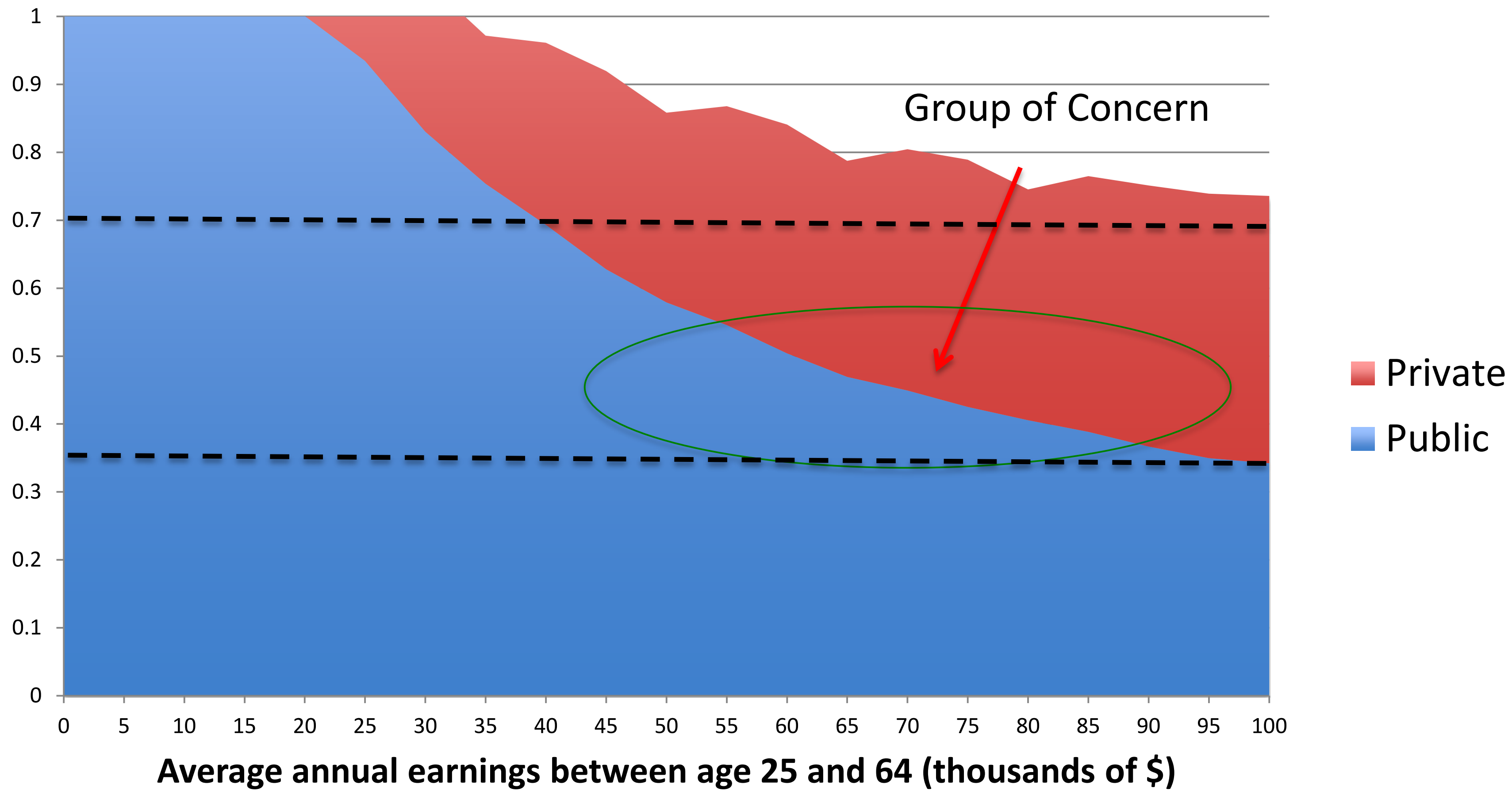
- Guaranteed Income Supplement (GIS): supplementary benefit, means-tested beyond $3,500 of employment income. Pays out a maximum, non-taxable benefit of **$9,100** as of September 2014, and runs out at $16,900 of income (other than OAS & GIS).

- 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.

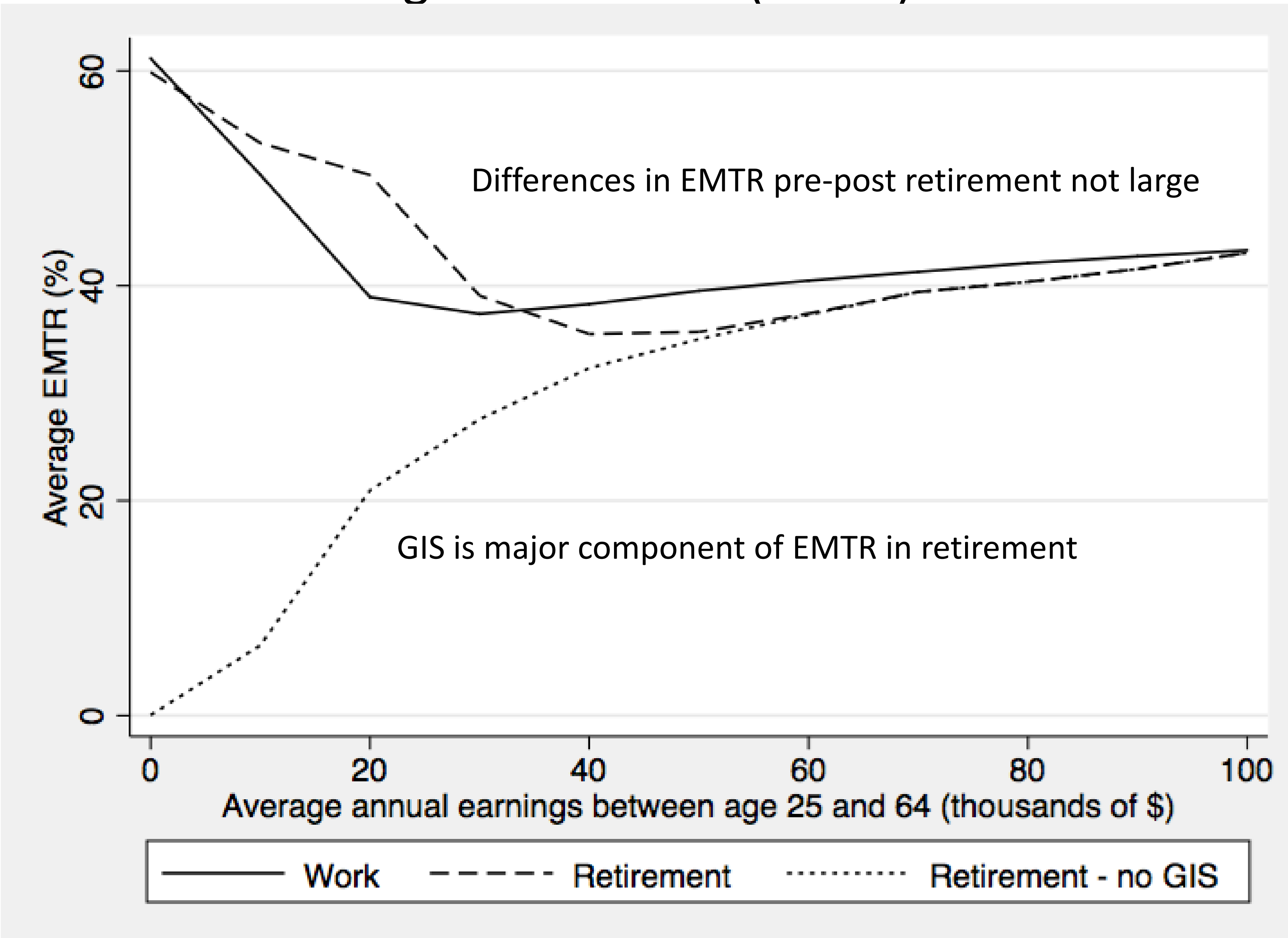
Private Pension Income

- 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

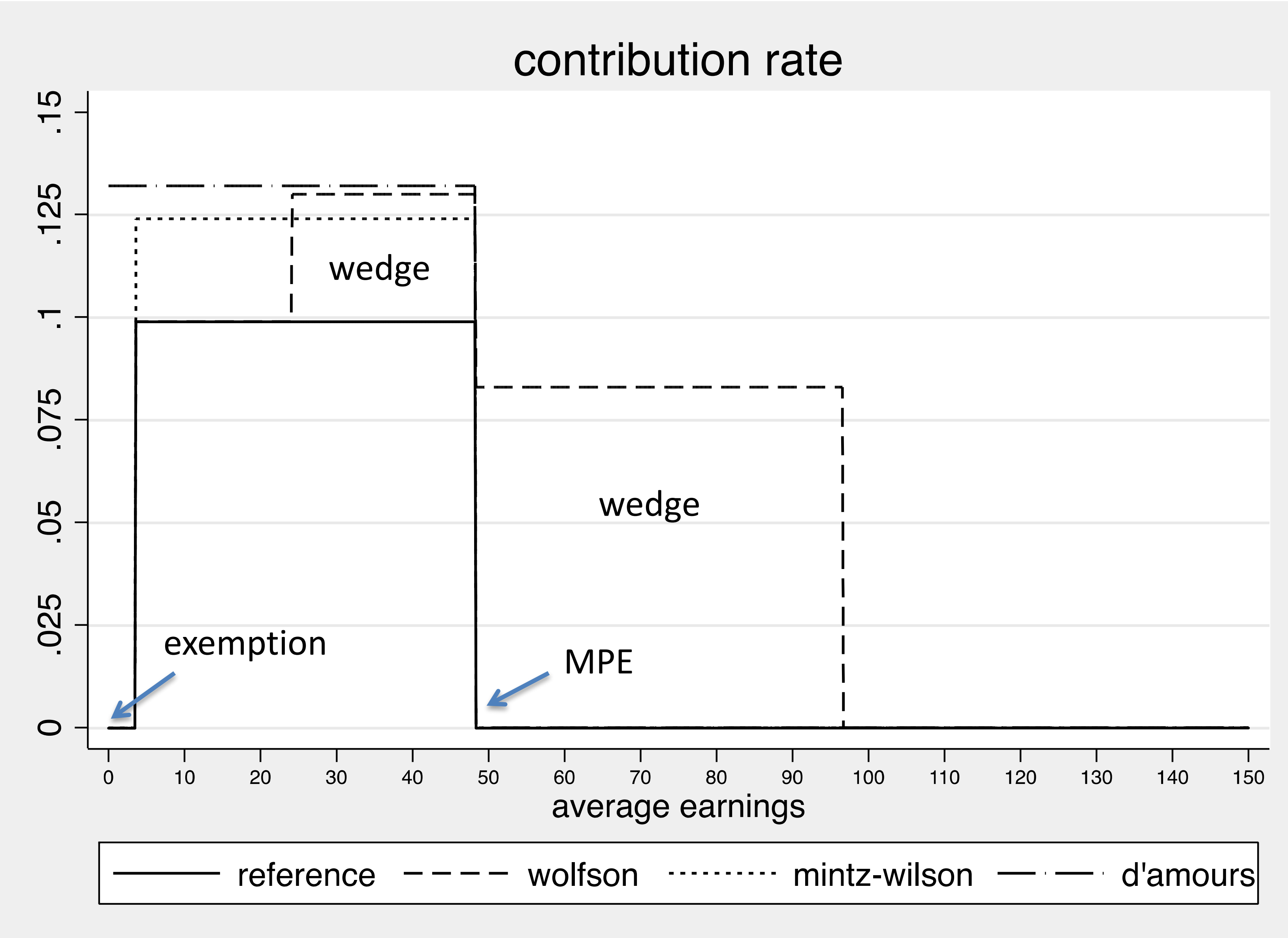


Effective Marginal Tax Rates (EMTR) : Reference

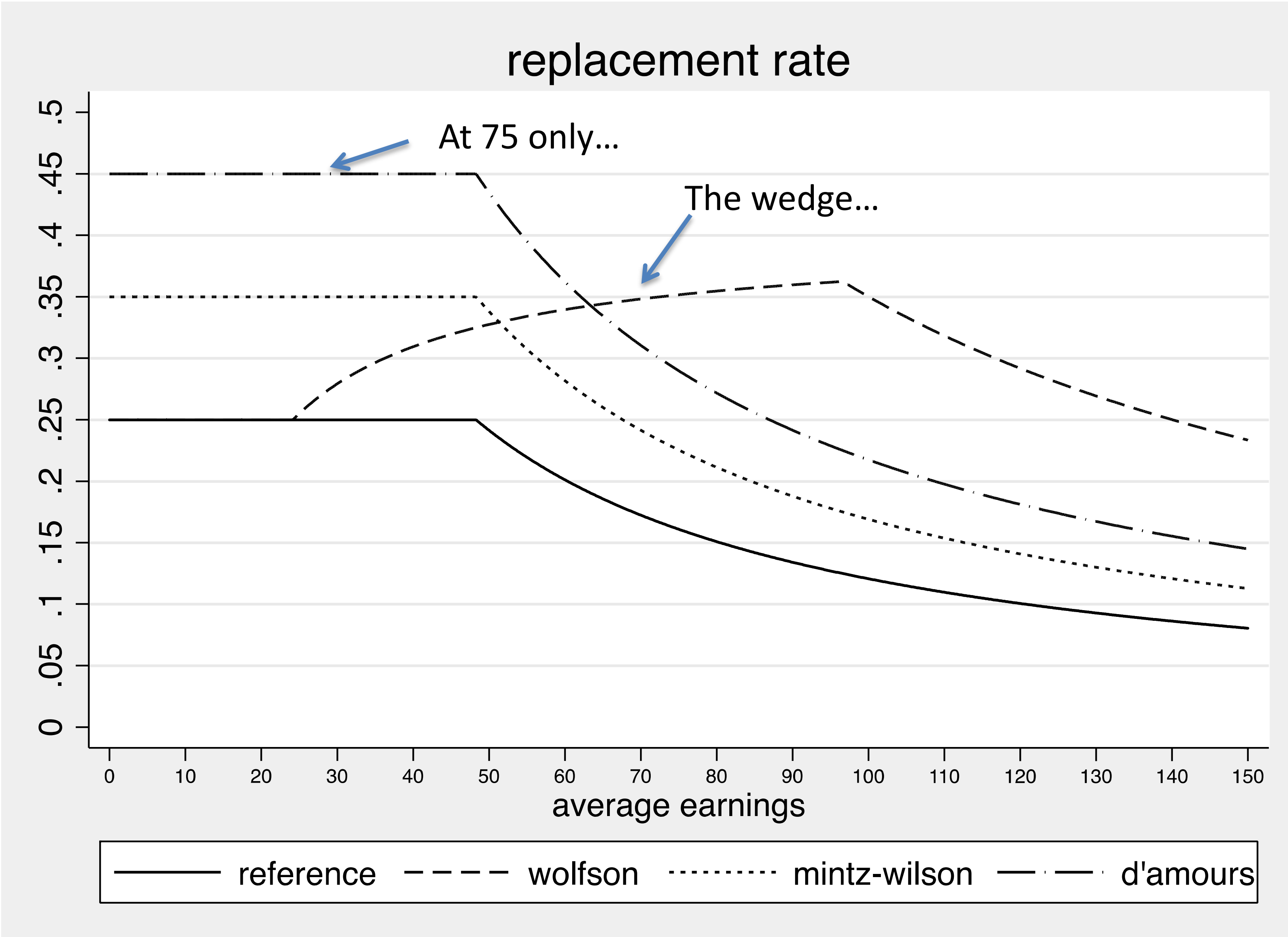


CPP/QPP-Based Reform Options

- 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)



contribution rate
0
.025
.05
.075
.1
.125
.15
wedge
wedge
exemption
MPE
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
average earnings
reference
wolfson
mintz-wilson
d'amours



replacement rate
At 75 only…
The wedge…
0
.05
.1
.15
.2
.25
.3
.35
.4
.45
.5
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
average earnings
reference
wolfson
mintz-wilson
d'amours

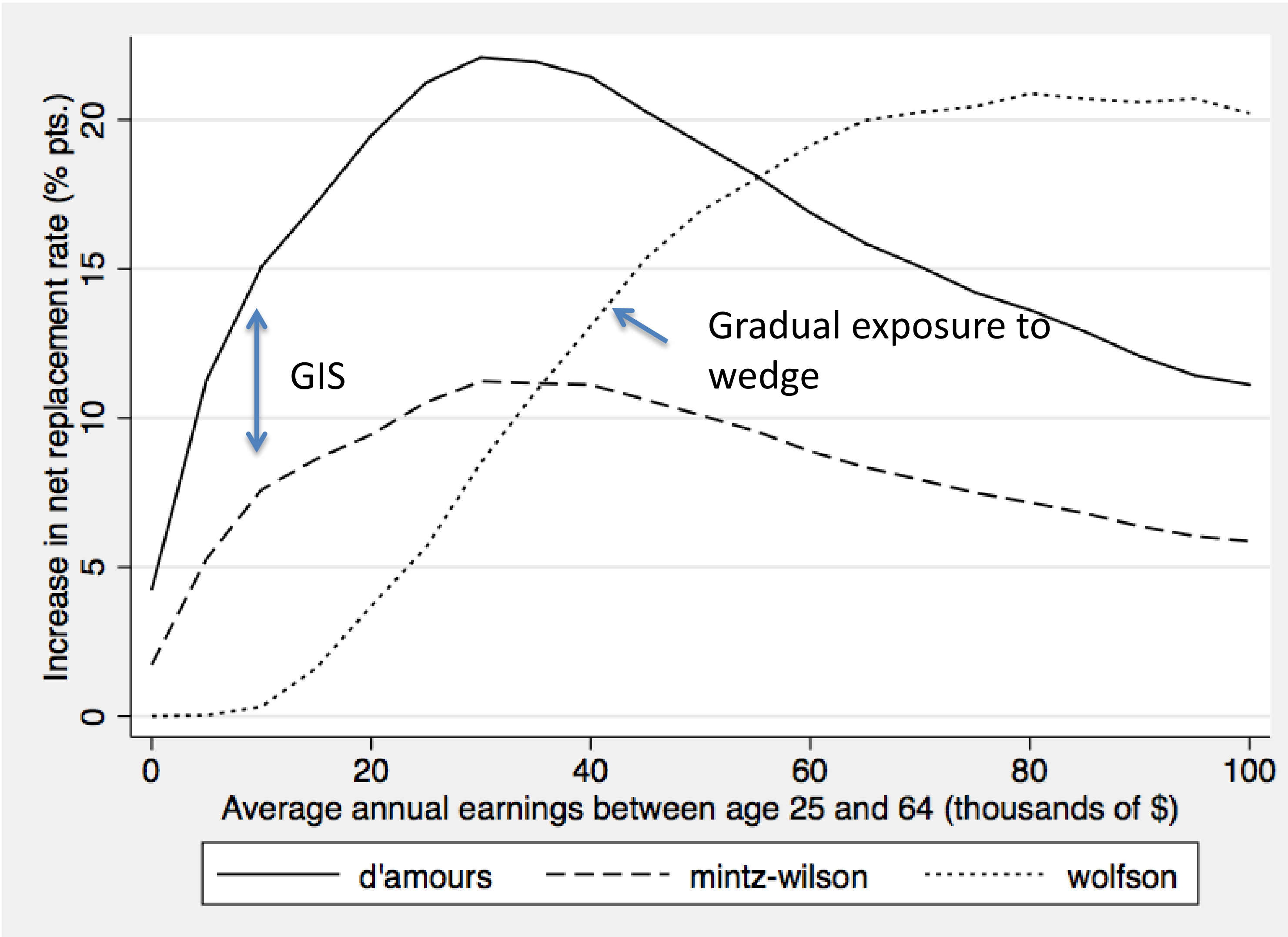
Other Voluntary Savings Options

- 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.

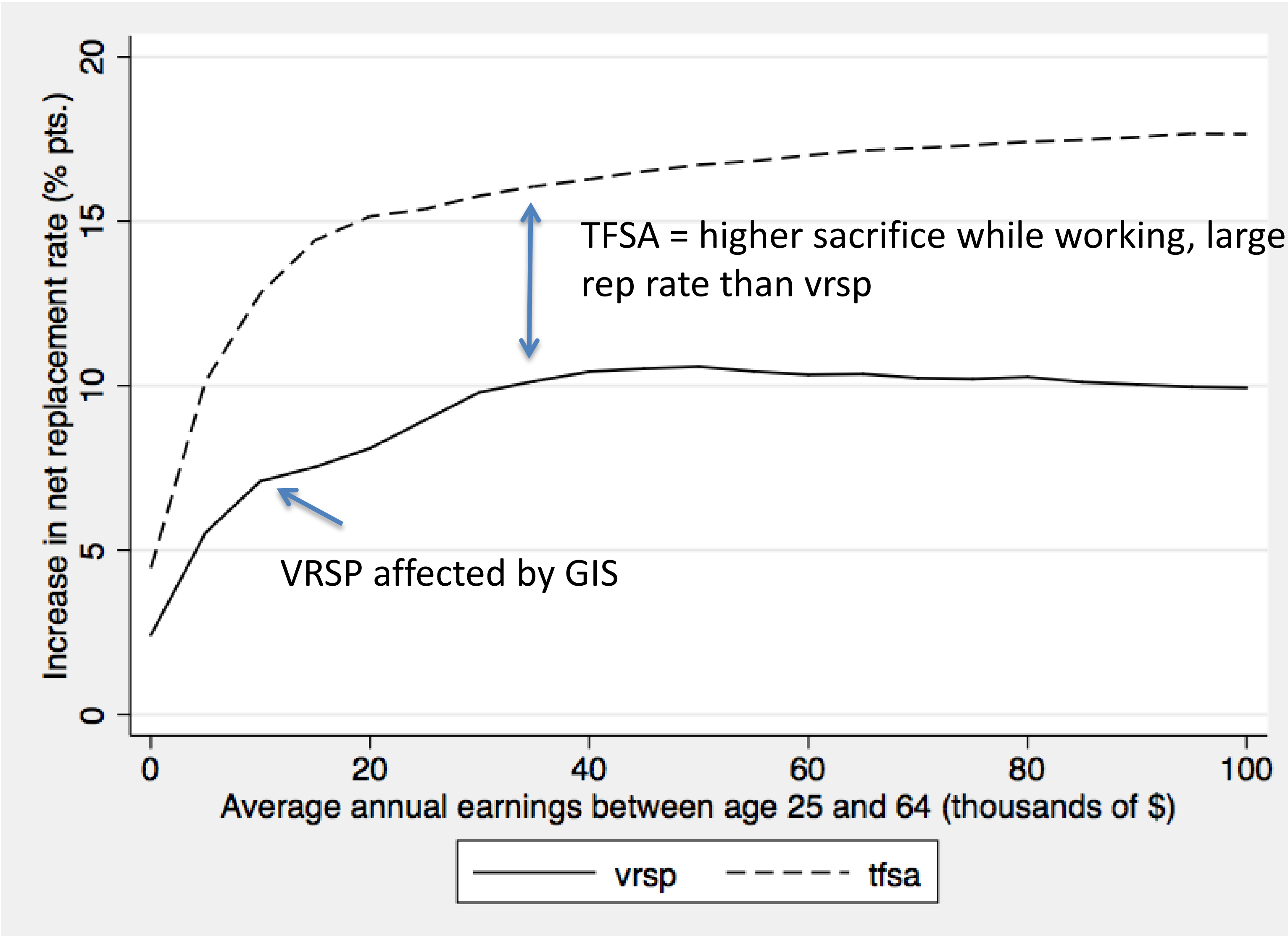
Annuity Prices from CANNEX

- 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



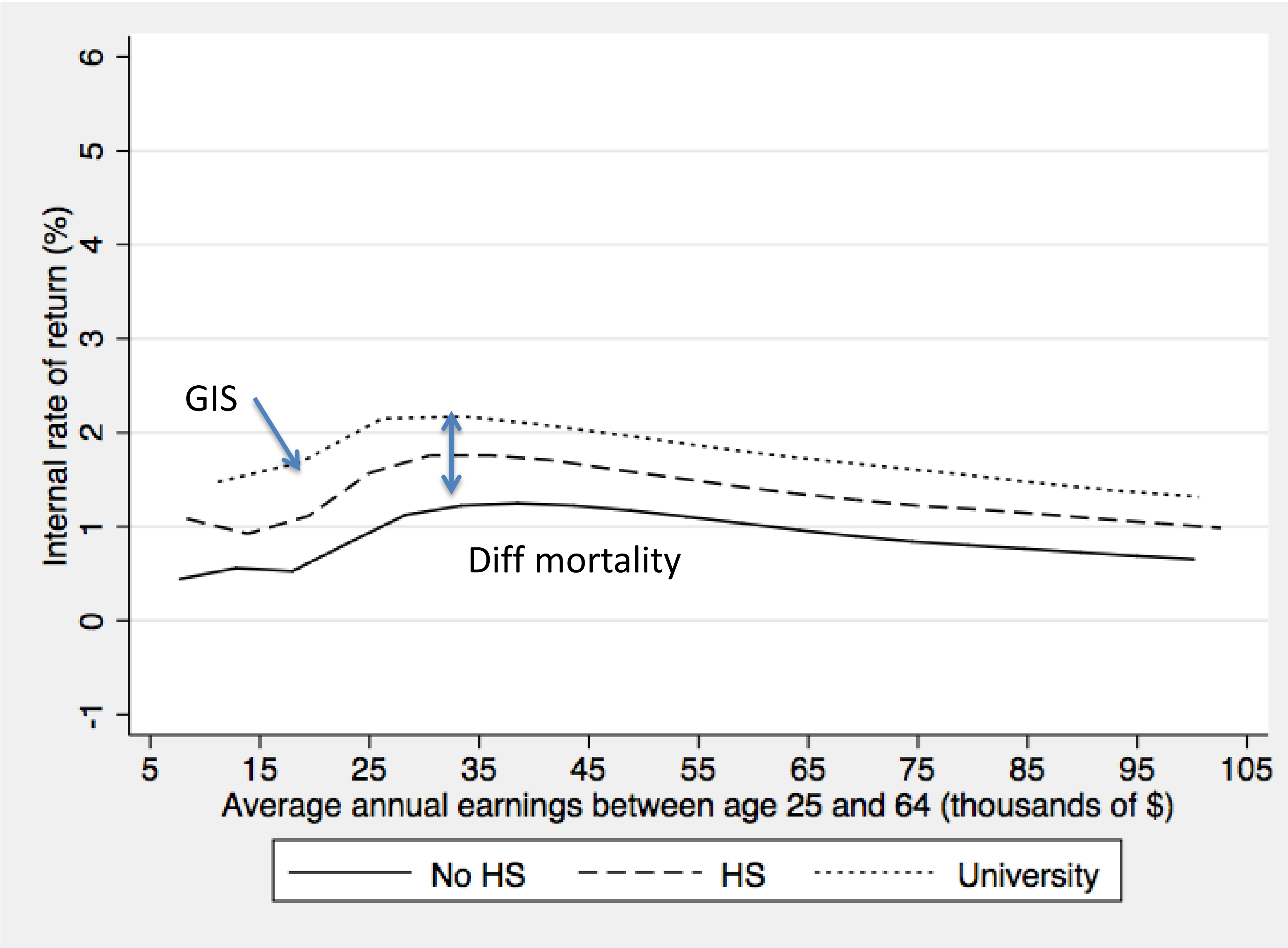
Effects on Net Replacement Rates at 75 y.o. – Voluntary Savings Options



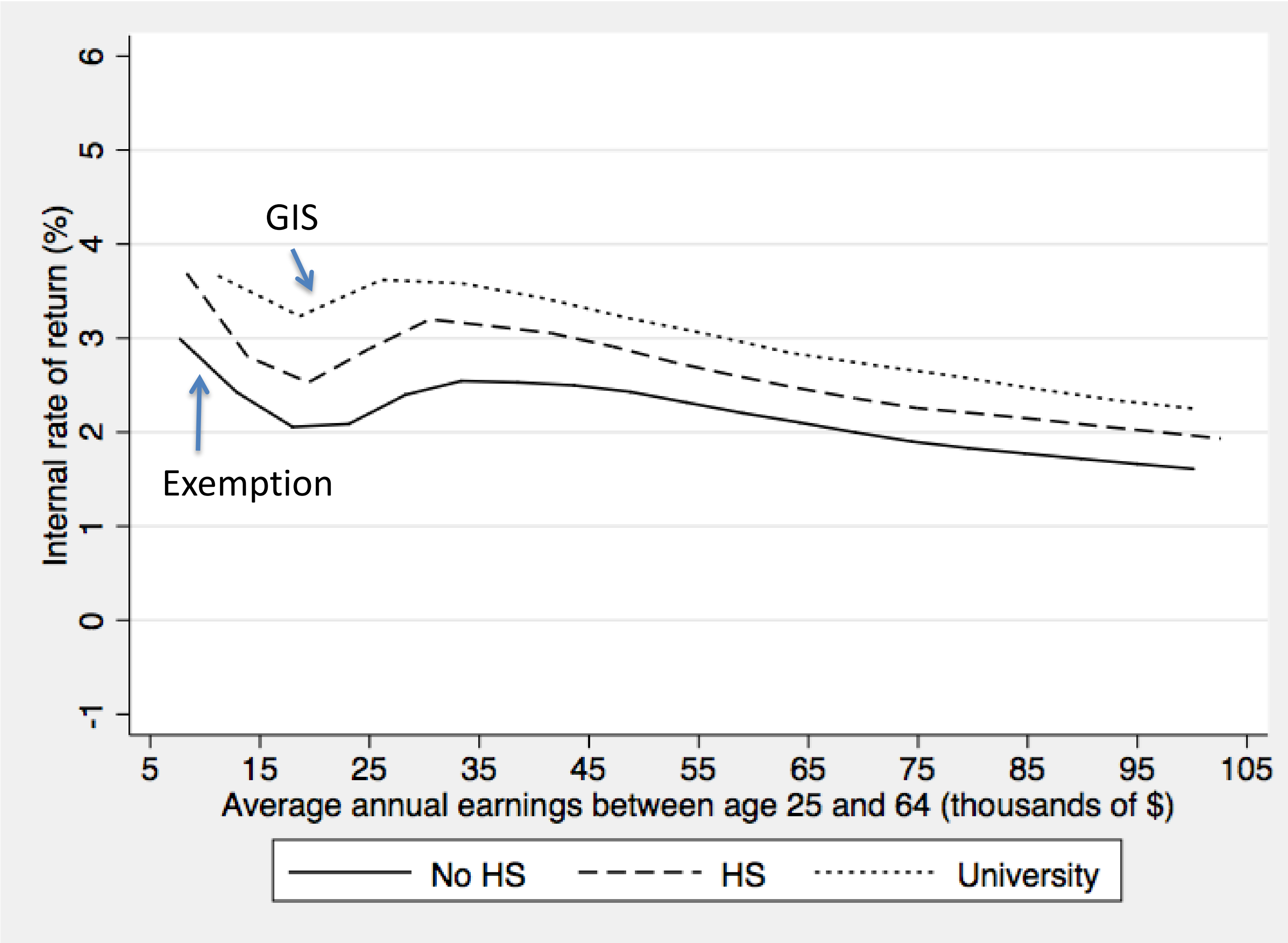
Internal Rate of Return Calculation

- 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

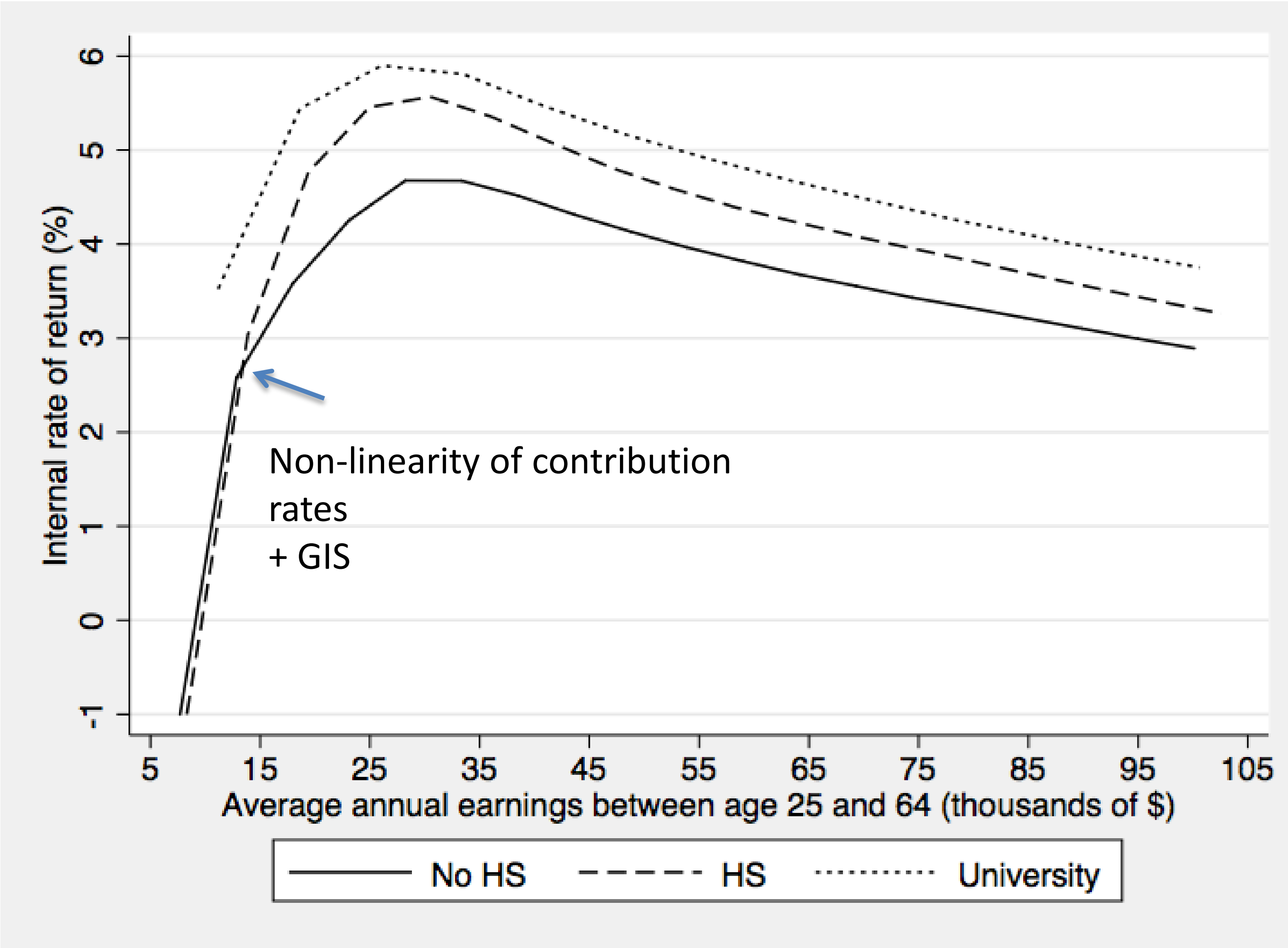
IRR for CPP/QPP-based Options – D'Amours



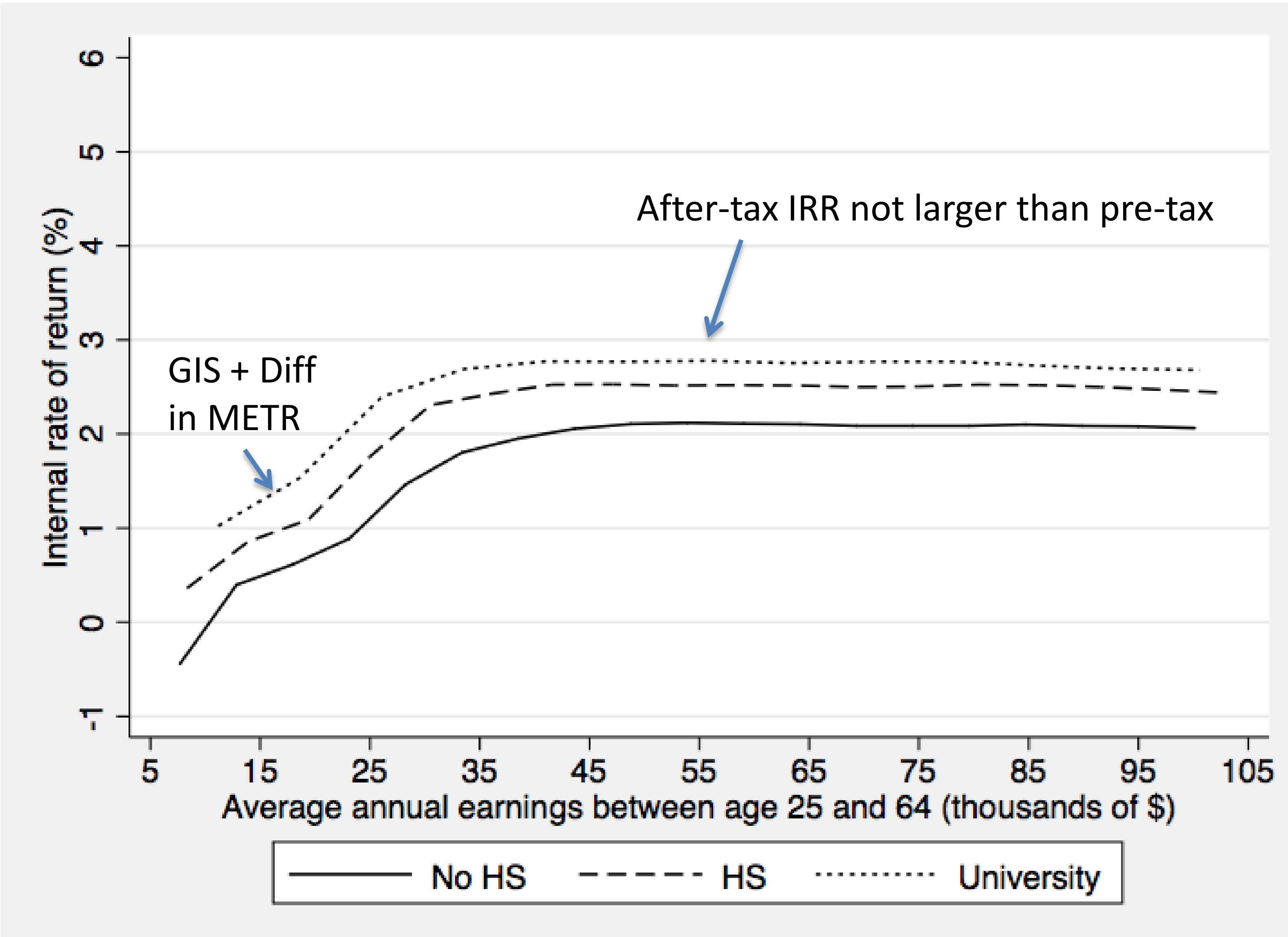
IRR for CPP/QPP-based Options – Mintz-Wilson



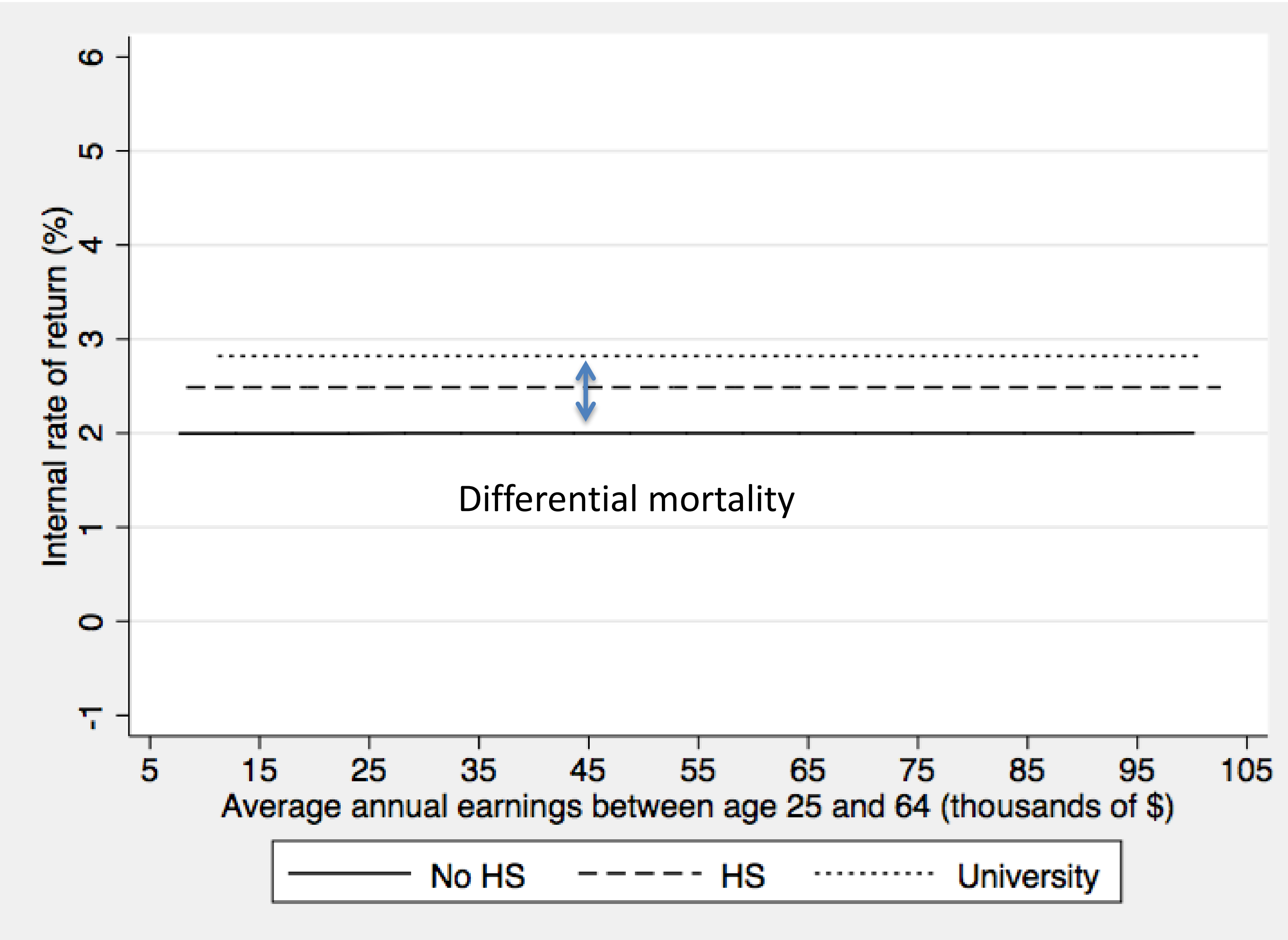
IRR for CPP/QPP-based Options – Wolfson



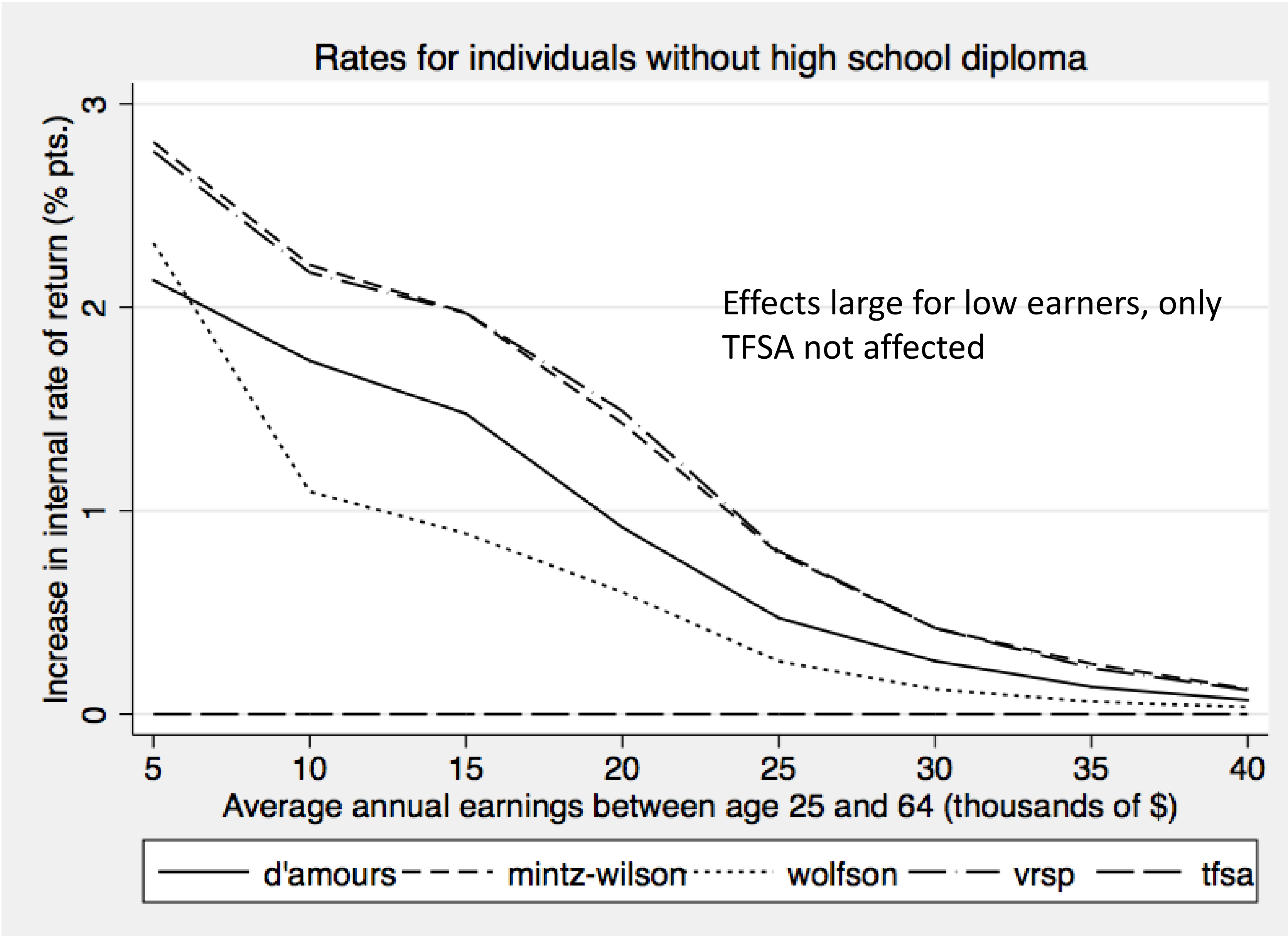
Voluntary Savings Options – VRSP



Voluntary Savings Options – TFSA



In a World Without GIS…



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