12th Global Meeting of the NTA Network

Applying the Economic Support Ratio to Canadian provinces between 1998 and 2060

Marcel Mérette & Julien Navaux
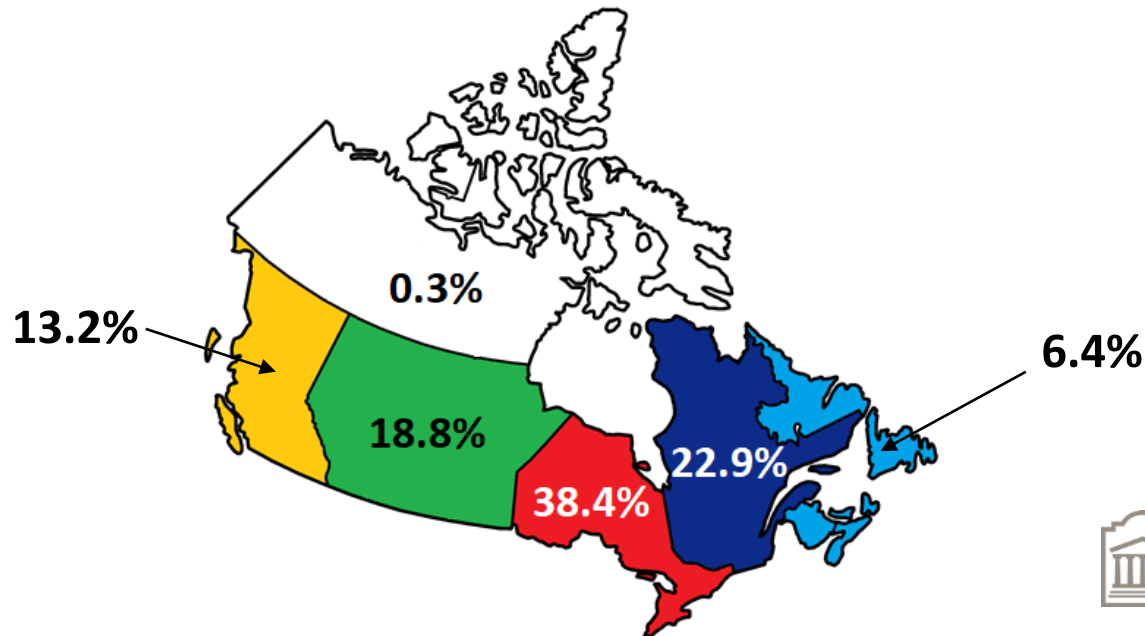
July 24, 2018

Issue

Share of people aged 65+ in provinces

	Canada	Atlantics	Québec	Ontario	Prairies	British Columbia
1998	12%	13%	12%	12%	12%	13%
2018	17%	21%	19%	17%	14%	19%
2038	24%	31%	25%	24%	19%	25%

Distribution of the 37 millions people in Canada, 2018

Contributions

- Suggesting a new dependency ratio called the "NTA economic support ratio" for Canada

- National Transfer Accounts (NTA) for Canadian provinces between 1998 and 2013:

  - Longitudinal NTA for few countries :

    - US: 1960-2003 (Lee Donehower & Miller, 2011)

    - Taiwan: 1985-2005 (Lai & Tung, 2015)

    - France: 1979-2011 (Navaux, 2016; d'Albis *et al.*, 2017, 2018)

    - Australia : 1981-2010 (Rice, Temple & McDonald, 2017)

  - Intra-country analysis:

    - Germany: 1980-2000 (Vogt & Kluge, 2015)

uOttawa

Outline

- An overview of dependency ratios
- NTA for Canada and provinces: Methodology and data
- Dependency ratios for Canada and provinces
  - Inverted demographic support ratio
  - NTA economic support ratios
- Conclusion

uOttawa

An overview of dependency ratios

- Inverted demographic support ratio:
  Ballod (1913); Notestein *et al.* (1944)

$$IDSR = \frac{\sum_{20}^{64} Pop_a}{\sum_{0}^{19} Pop_a + \sum_{65}^{90+} Pop_a}$$

With Pop_a = Number of residents at age a

uOttawa

An overview of dependency ratios

- Number of workers/Number of non-workers:

    International Labour Organisation (2011); Lutz, Butz & KC (2014)

$$\frac{WORK_a}{NON-WORK_a}$$

With $WORK_a$ = Number of workers (full-time equivalent)

With $NON-WORK_a$ = Number of non-workers

uOttawa

An overview of dependency ratios

- The NTA economic support ratio (1)

  Lee & Mason (2012); Lee (2014); Sanderson & Scherbov (2015)

$$\frac{YL}{C} = \frac{\sum_0^{90+} yl_a * Pop_a}{\sum_0^{90+} c_a * Pop_a}$$

With yl_a = per capita labour income at age a

With c_a = per capita total consumption (private and public) at age a

An overview of dependency ratios

- The NTA economic support ratio (2)
  Lee & Mason (2013)

$$\frac{YL + ABR}{C} = \frac{\sum_0^{90+} yl_a * Pop_a + \sum_0^{90+} abr_a * Pop_a}{\sum_0^{90+} c_a * Pop_a}$$

yl_a = per capita labour income at age a

c_a = per capita total consumption (private and public) at age a

abr_a = asset based reallocation (private and public) at age a

$$abr_a = Asset\ income\ - Saving$$

uOttawa

NTA for Canada and Provinces: Methodology and data

The life cycle deficit and the age reallocation system

In each province, at each age a:

$$C(a) - YL(a) = TG + TF + \textcolor{red}{TGP} + \textcolor{red}{TFP} + [YA(a) - S(a)]$$

Lifecycle deficit

Net private transfers

Net private transfers between provinces

Asset–based reallocations

Net public transfers

Net public transfers between provinces

uOttawa

NTA for Canada and Provinces: Methodology and data

- Atlantic provinces
- Québec
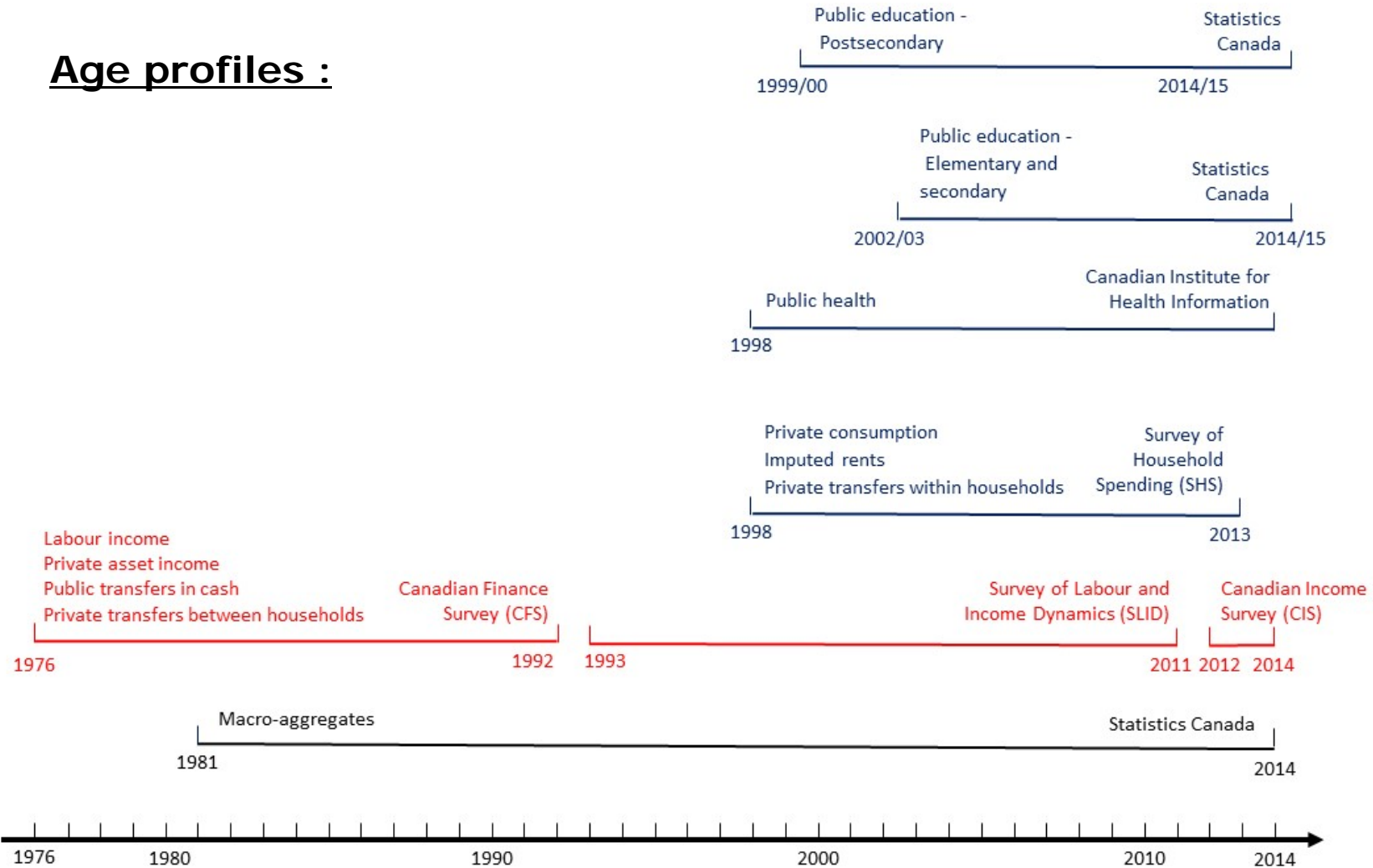- Ontario
- Prairies
- British Columbia

- 37 variables
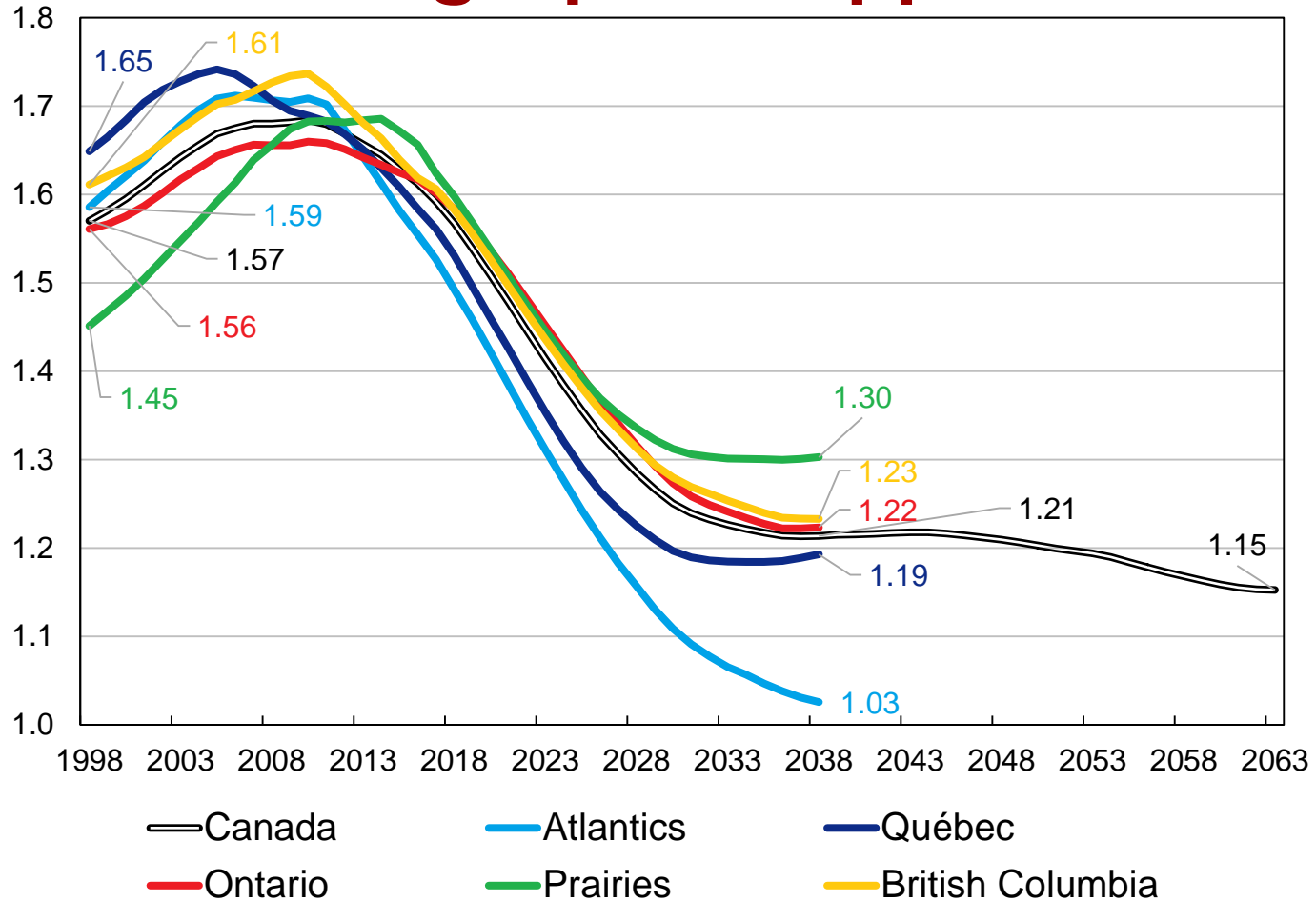- 5 regions
- 16 years (1998-2013)

uOttawa

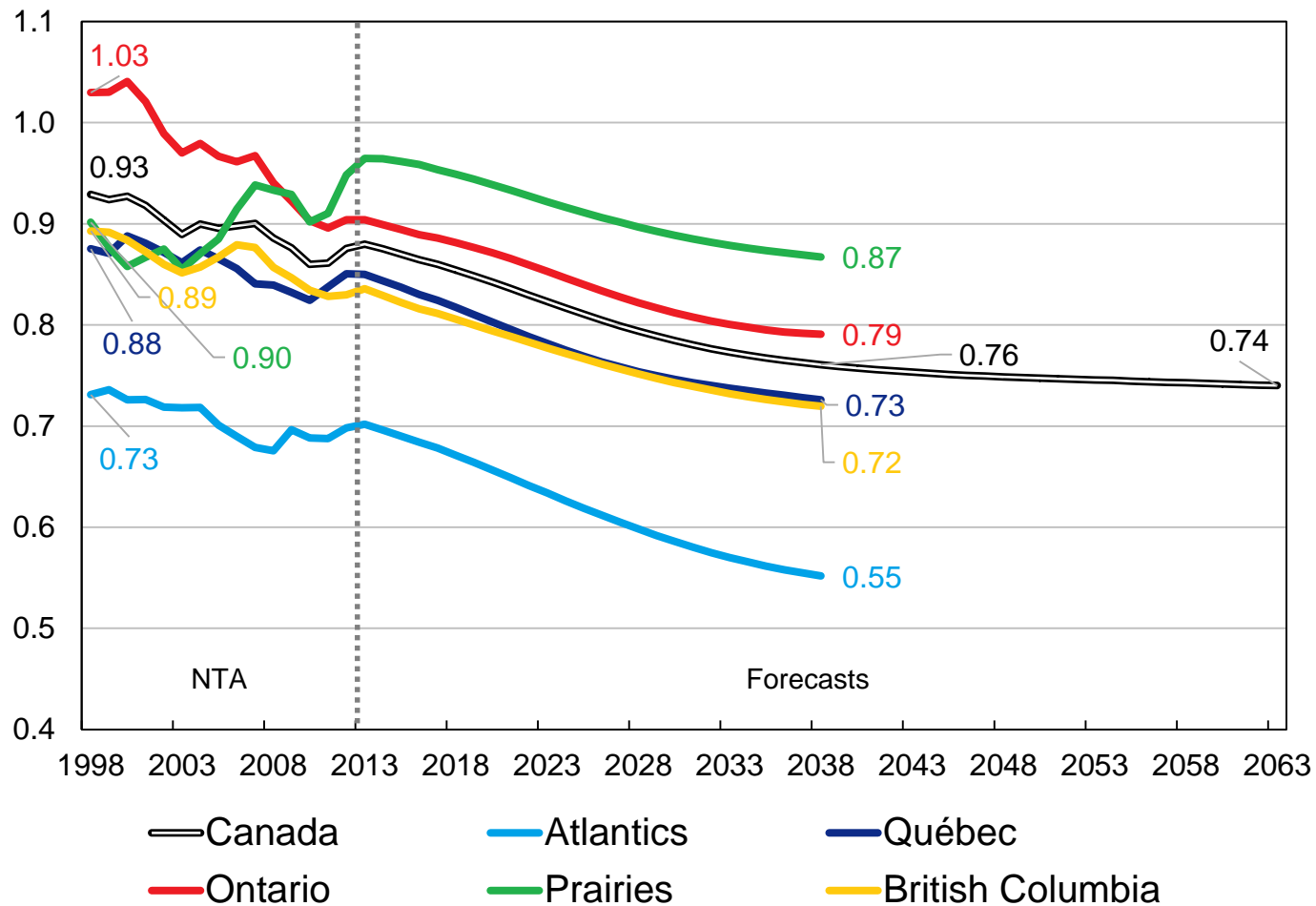# Macro-aggregates and age profiles

Age profiles :

Dependency ratios for Canada and provinces
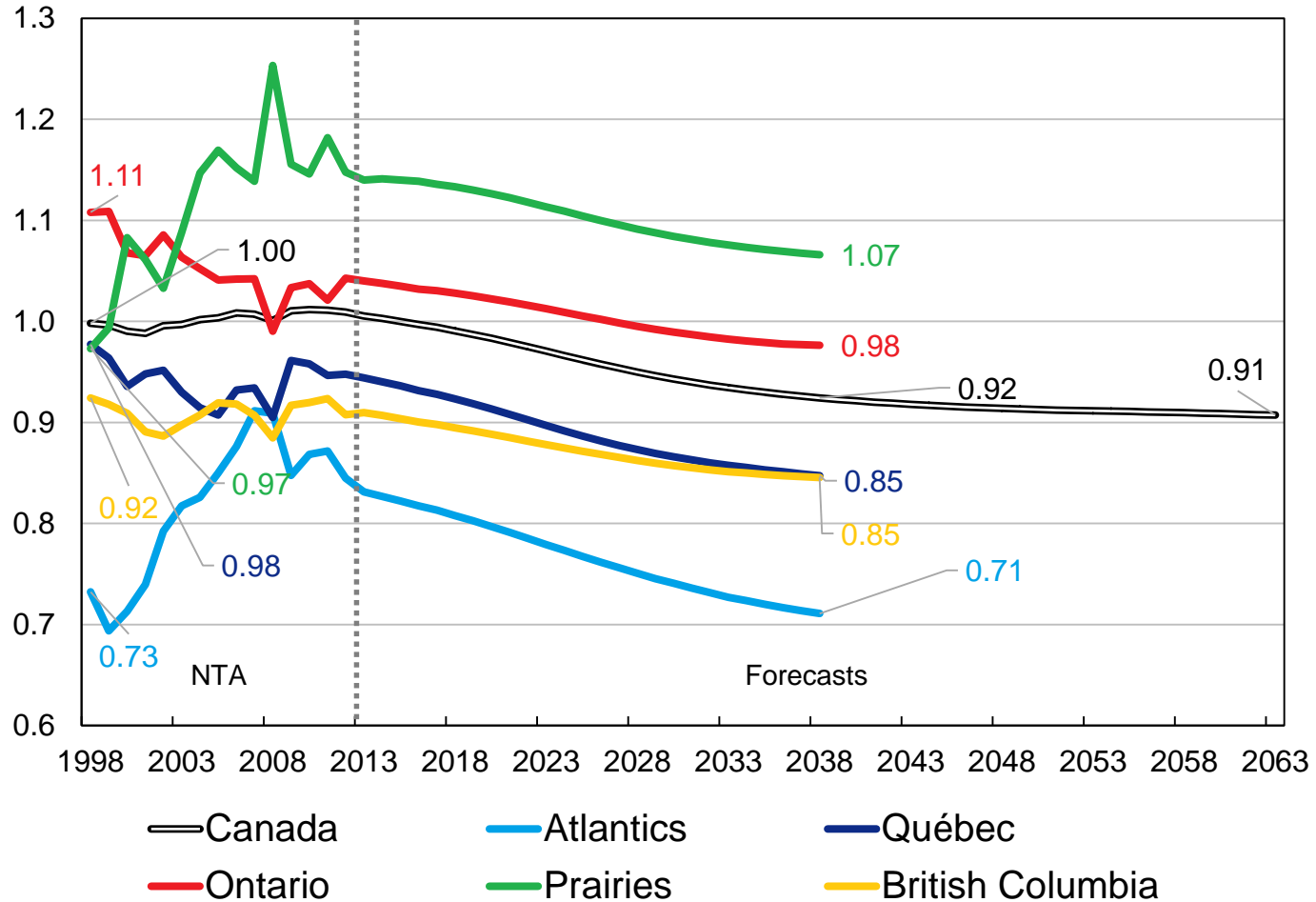
uOttawa

Inverted demographic support ratio

NTA economic support ratio $\frac{yl}{c}$

NTA economic support ratio $\frac{yl+abr}{c}$

Per capita age profiles

Legend:
- Atlantic Provinces
- Québec
- Ontario
- Prairies
- British Columbia

- C - 2013
- C - 1998
- YL+YA-S - 2013
- YL+YA-S - 1998

C and YL+YA-S are relative to per capita YL+YA-S at age 30-49