A Population Aging Analysis for Canada Using the National Transfer Accounts Approach

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Outline

• Motivation and objective
• Data and methodologies
• Main results
• Conclusions
Population Aging

• Baby boom, baby bust, increased life expectancy
• Old-age dependency ratio will more than double in the next 30 years
• Major, slow and long demographic shift
• Canada and most industrialized countries
Growth of Population

- Net immigration
- Natural increase
- Total

Thousands

- 1976
- 1981
- 1986
- 1991
- 1996
- 2001
- 2006
- 2011
- 2016
- 2021
- 2026
- 2031
- 2036
- 2041
- 2046
Age Pyramid of Canada Population

Source: Statistique Canada (2008)
Dependency Ratio

Population ageing means fewer workers to support an older population.

Working-age Population relative to Population 65+

<table>
<thead>
<tr>
<th>Year</th>
<th>History</th>
<th>Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>7.9</td>
<td>5.3</td>
</tr>
<tr>
<td>2046</td>
<td>2.4</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Source: Office of the Chief Actuary
Objective

• Build a NTA database for Canada
• Apply LCD data by using demographic projections for the next 50 years to project LCD in Canada (2007-2056)
Data and Methodology

Surveys
• Household Spending (SHS)
• Labour Income Dynamics (SLID)
• Canadian Community Health (CCHS)

Years: 2004-2007 (LCD); 2006 (example)

Components
• LCD
• Public Transfer
• Private Transfer

Methodology: data availability and NTA
Private and Public Consumption

Per Capita Consumption, Private and Public by Sectors, Canada, 2006

Private Education
Other Public
Public Education
Other Private
Private Health
Public Health
Private and Public Consumption

Per Capita Consumption, Private and Public by Sector, USA, 2003

Data source: NTA website
Comparison of Per Capita Consumption Profiles

Summary

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>% of Total</td>
<td>% of Total</td>
</tr>
<tr>
<td>Consumption</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Private consumption</td>
<td>67.38</td>
<td>73.02</td>
</tr>
<tr>
<td>Education</td>
<td>0.74</td>
<td>1.24</td>
</tr>
<tr>
<td>Health</td>
<td>3.21</td>
<td>9.68</td>
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<tr>
<td>Others</td>
<td>63.42</td>
<td>62.10</td>
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<tr>
<td>Public consumption</td>
<td>32.62</td>
<td>26.98</td>
</tr>
<tr>
<td>Education</td>
<td>5.66</td>
<td>4.25</td>
</tr>
<tr>
<td>Health</td>
<td>14.70</td>
<td>10.17</td>
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<tr>
<td>Others</td>
<td>12.26</td>
<td>12.56</td>
</tr>
</tbody>
</table>

Comparison Health and Education Consumption, (%)

<table>
<thead>
<tr>
<th>Age group</th>
<th>CAN</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private education under age 25 / Total education consumption for all ages</td>
<td>8.48</td>
<td>15.46</td>
</tr>
<tr>
<td>Public education under age 25/ Total education consumption for all ages</td>
<td>78.21</td>
<td>73.50</td>
</tr>
<tr>
<td>Private health above age 65/ Total health consumption for all ages</td>
<td>8.05</td>
<td>22.71</td>
</tr>
<tr>
<td>Public Health Above age 65/ Total health consumption for all ages</td>
<td>57.15</td>
<td>39.41</td>
</tr>
</tbody>
</table>
Labour Income and Consumption per Capita Canada, 2006
Lifecycle Deficit, Per Capita, 2006

Deficit

Surplus

LCD per capita 2006
Comparison of Per Capita Labour Income

Summary

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>CAN</th>
<th>Sweden</th>
<th>France</th>
<th>Japan</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Age</td>
<td>47</td>
<td>49</td>
<td>49</td>
<td>49</td>
<td>48</td>
<td>41</td>
</tr>
<tr>
<td>Share under age 25 (%)</td>
<td>6.04</td>
<td>7.83</td>
<td>7.07</td>
<td>7.01</td>
<td>5.66</td>
<td>6.89</td>
</tr>
<tr>
<td>Share above age 65 (%)</td>
<td>7.76</td>
<td>2.91</td>
<td>9.60</td>
<td>1.15</td>
<td>5.73</td>
<td>4.19</td>
</tr>
</tbody>
</table>

Data source: NTA website
Comparison of LCD Per Capita— Main Results (5/9)

Normalized LCD Per Capita

Table: Comparison of Economic Lifecycle of Selected Countries

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>CAN</th>
<th>Sweden</th>
<th>France</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross age (LCD to LCS)</td>
<td>26</td>
<td>25</td>
<td>23</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Cross age (LCS to LCD)</td>
<td>59</td>
<td>60</td>
<td>65</td>
<td>59</td>
<td>56</td>
</tr>
<tr>
<td>Span (years)</td>
<td>33</td>
<td>35</td>
<td>42</td>
<td>36</td>
<td>33</td>
</tr>
</tbody>
</table>

Data source: NTA website www.ntaccounts.org
Transfers: Public, per capita

Public Transfer on Education

Public Transfer on Health
Three pillars of the retirement income system

Old Age Security Program
  Old Age Security Pension
  Guaranteed Income Supplement
  Spouse’s Allowance
Canada/Quebec Pension Plans
Private savings, private pensions, RRSPs, etc
Service Canada statistics: 73$ billion to pension benefit in 2008
Intra-household Transfer-Education per capita, Canada 2006

Interhousehold Transfer inflow on Education
Interhousehold Transfer Outflow on Education
net
Intra-household Transfer-Health per capita, Canada 2006

- Intrahh transfer inflow on health per capita
- Intrahh transfer outflow on health per capita
- net
Lifecycle Deficit-Projection (2006-2056)

Assumptions
• Constant lifecycle pattern as 2006
• The only factor changing is population

Keys
• 2010, 100$ billions → 2056, 300$ billions → 3 times
Projection of growth rate of aggregate LCD, population, and ageing factor

Definitions
Age factor-change of age structure (ageing: more elderly, less working age population)

Keys
1/3 impact of LCD growth is from the growth of total population
2/3 impact of LCD growth is from the growth of age factor.
Scenario 1

Growth Rate of Labour Income in Projection if Constant LCD 2006
Scenario 2

Figure: b) Growth Rate of Consumption in Projection if Constant LCD 2006
Conclusion

• Impact of age factor is significant, even no changing in the total population

• Ageing factor increases rapidly after 2008, and reaches maximum 2.78% in 2026

• Average growth rate of aggregate LCD is 2.59%
  Average growth rate of age factor (2006-2026): 1.89%. → age factor captures 73%.

• To keep aggregate LCD constant
  o Scenario 1: labour income must increase from less than 0.2% in 2007 to 0.75% in 2023
  o Scenario 2: consumption must be cut at a rate from less than 0.2% in 2007 to 0.7% in 2023

• Canada: future in NTA
  o Full NTA across years → applications
  o Immigrants (new and old) versus citizen
Thank you.