Decomposing the impact of increased educational attainment on demographic dividend in Singapore, 1970–2010

Christopher Gee, Fengqing Chao

Institute of Policy Studies, Lee Kuan Yew School of Public Policy
National University of Singapore

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Introduction

1. Introduction
   - Background
   - Objectives
Since 1970, higher educational attainment has increased greatly in Singapore, especially for tertiary education:

- In 2016, 30% of the population aged 20+ not in full-time education had a university degree and above, up from 5% as recently as in 1990

- There is still a large group of primarily older persons with lower than secondary school education

- 10% of the population aged 65 years and older have some form of tertiary educational qualifications
Objectives

- Compute lifecycle deficit for Singapore residents by education level from 1970 to 2010
- Compute economic support ratio for Singapore residents by education level from 1970 to 2010
Data and Methods

Data

- The labor income and consumption for Singapore resident population is by single-year of age from age 0 to age 85+ and by education level in the year 2013
- The data on Singapore resident population by education level are from the 1970, 1980, 1990, 2000, and 2010 census reports

Methods

We use the NTA methodology to compute the lifecycle deficit and economic support ratio in Singapore by education level for the year 1970, 1980, 1990, 2000, and 2010
Results

3 Results

- Population structure by education level
- Singapore NTA profile in 2013
- Economic support ratio by education level
- Life cycle surplus and deficit
Population structure by education level

Resident Population (by Education Level)

- Number (in millions)
  - 2.1 (1970)
  - 2.4 (1980)
  - 2.7 (1990)
  - 3.2 (2000)
  - 3.8 (2010)

- Percentage (in %)
  - Total
  - Primary and Below
  - Lower Secondary
  - Upper Secondary
  - Tertiary

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Singapore NTA by education level

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Population structure by education level

Singapore resident population: Primary and below, by age group

- Year 1970
- Year 1980
- Year 1990
- Year 2000
- Year 2010
Singapore resident population: Lower Secondary, by age group
Population structure by education level

Singapore resident population: Upper Secondary, by age group

Year 1970, Year 1980, Year 1990, Year 2000, Year 2010
Population structure by education level

Singapore resident population: Tertiary and above, by age group
Singapore NTA profile in 2013

Average consumption and labor income by education level (Singapore 2013)

[Graph showing average consumption and labor income by education level in Singapore 2013. The graph plots age against Singapore $ (in thousands) and shows a comparison between two education levels: Primary and Below.]
Singapore NTA profile in 2013

Average consumption and labor income by education level (Singapore 2013)

- Primary and Below
- Lower Secondary
Singapore NTA profile in 2013

Average consumption and labor income by education level (Singapore 2013)

- Primary and Below
- Lower Secondary
- Upper Secondary

Age in Singapore $ (in thousands)
Singapore NTA profile in 2013

Average consumption and labor income by education level (Singapore 2013)

- Primary and Below
- Lower Secondary
- Upper Secondary
- Polytechnic

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Average consumption and labor income by education level (Singapore 2013)
Economic support ratio by education level

Economic Support Ratio by Education Level

- **Total**
- **Primary and Below**
- **Lower Secondary**
- **Upper Secondary**
- **Tertiary**

<table>
<thead>
<tr>
<th>Year</th>
<th>Economic Support Ratio (log-scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>0.715</td>
</tr>
<tr>
<td>1980</td>
<td>1.089</td>
</tr>
<tr>
<td>1990</td>
<td>1.521</td>
</tr>
<tr>
<td>2000</td>
<td>1.945</td>
</tr>
<tr>
<td>2010</td>
<td>2.074</td>
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</tbody>
</table>

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Singapore NTA by education level

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Life cycle surplus and deficit

Productive Years – Life Cycle Surplus (by Education Level)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Primary and Below</th>
<th>Lower Secondary</th>
<th>Upper Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>23</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1980</td>
<td>33</td>
<td>25</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1990</td>
<td>40</td>
<td>30</td>
<td>4</td>
<td>6</td>
<td>1</td>
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<tr>
<td>2000</td>
<td>50</td>
<td>40</td>
<td>5</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>2010</td>
<td>57</td>
<td>50</td>
<td>6</td>
<td>12</td>
<td>1</td>
</tr>
</tbody>
</table>

Legend:
- Red: Primary and Below
- Green: Lower Secondary
- Blue: Upper Secondary
- Cyan: Tertiary
Life cycle surplus and deficit

Young Dependency Years – Life Cycle Deficit (by Education Level)

-30 -25 -20 -15 -10 -5 0
Year
Young Dependency Years – Life Cycle Deficit (in billions)

-30 -29 -21 -22 -22
Year
Young Dependency Years – Life Cycle Deficit
(in %)


Total
Primary and Below
Lower Secondary
Upper Secondary
Tertiary

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Singapore NTA by education level

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Life cycle surplus and deficit

Old Dependency Years – Life Cycle Deficit (by Education Level)

Year

Old Dependency Years – Life Cycle Deficit (in %)

Year

Total
Primary and Below
Lower Secondary
Upper Secondary
Tertiary
Discussion

- Conclusion
- Next steps
Conclusion

- The increased proportion of the Singapore resident population with higher education status is one of main causes for the increase in the economic support ratio during 1970–2010
- Since 2000, the economic support ratios for every education level declined, which is largely due to population ageing
- The increased population with higher education compensated for the ageing effect
- Hence, economic support ratios for the total resident population remained on an upward trend throughout 1970–2010

Limitation

- Foreigners who are not permanent residents are not included in the study since data are not publicly available
Next steps

- Compute the age-standardised change in the economic support ratio during 1970–2010
- Compute the education-standardised change in the economic support ratio during 1970–2010
- Decompose the change in the economic support ratio for total resident population over time in two parts:
  1. how much of the first demographic dividend is due to age structure
  2. how much of the first demographic dividend is due to education attainment