Demographic Dividends in Singapore: Past and Future

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Introduction: the demographic context
Very rapid demographic transition

Rapid transition from young, to an ageing, aged and super-aged society

The demographic dividends

First demographic dividend (bonus, gift, window of opportunity)

Second demographic dividend (Mason & Lee, 2004)
The demographic dividends

First demographic dividend (bonus, gift, window of opportunity)

- Fertility decline reduces young-age dependency and increases share of working-age population
- Leads to a boost in economic productivity
- Arithmetic in nature, ultimately transient

Second demographic dividend (Mason & Lee, 2004)
The demographic dividends

First demographic dividend (bonus, gift, window of opportunity)

Second demographic dividend (Mason, 2005)

- Accumulation of savings as rational response to ageing
- Invested savings can lead to capital deepening and increased productivity per worker
- Applies to economic capital and broadened to include human capital investments (health and education)
Methodology for estimating the DDs
Estimating the first dividend

**Economic support ratio (ESR):** effective number of producers to effective number of consumers

From Mason & Lee (2006)
Estimating the second dividend

- Declining Support Ratio
  - Accumulate transfer wealth
    - No second dividend
  - Accumulate assets
    - Savings not effectively invested (productivity does not rise sufficiently to offset rise in consumption as result of ageing)
      - No or limited second dividend
    - Savings effectively invested (productivity rises sufficiently to offset rise in consumption as result of ageing)
      - Second dividend accrues
Mason & Lee (2006) set out a quantitative method involving the calculation of the *lifetime support ratio* (LSR):

the effective number of producers discounted and cumulated over the lifetime of all year $t$ adults divided by

the effective number of consumers discounted and cumulated over the lifetime of all year $t$ adults.

\[
\frac{W(t)}{W_1(t)} = c(t) \frac{SR(t)}{LSR(t)} - 1
\]

\[
LSR(t) = \frac{\int_{0}^{\omega} e^{[g_y(t,x)-r(t,x)]} \int_{0}^{\omega-x} L(z+x, t+x)dzdx}{\int_{0}^{\omega} e^{[g_c(t,x)-r(t,x)]} \int_{0}^{\omega-x} N(z+x, t+x)dzdx}
\]
The first dividend in Singapore
• First demographic dividend contributed 38% of GDP per capita growth between 1967 to 2012

• Reversal of first demographic dividend result in a -1.6% per annum drag in GDP per capita growth from 2015 to 2060
The second dividend in Singapore
Savings accumulation points to 2nd DD?

Household net worth, $ billions

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Net Worth, $ billions</th>
</tr>
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<tbody>
<tr>
<td>FY2000</td>
<td>487</td>
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<tr>
<td>FY2003</td>
<td>600</td>
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<tr>
<td>FY2006</td>
<td>800</td>
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<tr>
<td>FY2009</td>
<td>1,000</td>
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<tr>
<td>FY2012</td>
<td>1,200</td>
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<tr>
<td>FY2015</td>
<td>1,400</td>
</tr>
<tr>
<td>FY2018</td>
<td>1,600</td>
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<tr>
<td>FY2021</td>
<td>1,746</td>
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</tbody>
</table>
Second dividend estimated

Quantifying Singapore’s First and Second DDs

Average annual change in ESR (first DD) and LSR (second DD)

These demographic dividend (DD) calculations only capture lifetime labour income and consumption using age-profiles from 2013.
The future of demographic dividends in Singapore
Changing lifetime labour income profiles

- From higher educational attainment over life-course, leading to improved lifetime labour income
- Changing nature of work (from manual work to knowledge work) to prolong productive capacity, especially at older ages, e.g. delaying retirement
Second dividend: an educational dividend?

- % of working age population with tertiary qualifications: 87%
- % of 65+ population with tertiary qualifications: 85%

2060
Second dividend: a health longevity dividend?

(Matsukura, 2015)
Extending the dividend accumulation phase

Extending the period of lifecycle surplus accumulation

2015 2025 2035 2045 2055 2065 2075 2085 2095

SGD'000s

Lifecycle Deficit/ Surplus

Continuing Demographic Dividends
No Continuing Demographic Dividends
Other demographic dividends to accrue?
Gender dividend – market work

Resident Labour Force Aged Fifteen Years and Over by Highest Qualification Attained and Gender

Source: Labour Force in Singapore Surveys, Ministry of Manpower, Singapore
Capturing the DDs: the challenge

Successfully capturing demographic dividends at a societal level depends on:

• Norms
• Institutions
• Policies

and the capacity of each society for change in the above.
Change needed to capture 2nd DD: Education

Education expenditure per capita over the life course

Education expenditure per capita 2013

Education expenditure per capita spread more evenly over the lifecourse

Age in years
Demographic dividends: policy dependency

To capture demographic dividends **policy focus and implementation** necessary in:

**Education**

**Health**

**Fiscal/public revenues-expenditure**
Demographic dividends: policy dependency

To capture demographic dividends **policy focus and implementation** necessary in:

**Education**
- Spreading educational investments over the life-course
- The economic and social returns to education over the life-course

**Health**

**Fiscal/public revenues-expenditure**
Demographic dividends: policy dependency

To capture demographic dividends **policy focus and implementation** necessary in:

**Education**

**Health**
- Changing care requirements provided by health systems (primary, tertiary, long-term care)
- Mental health and well-being

**Fiscal /public revenues-expenditure**
Demographic dividends: policy dependency

To capture demographic dividends **policy focus and implementation** necessary in:

**Education**

**Health**

**Fiscal/public revenues-expenditure** (how public transfers are funded)
- Intersection of public finances with:
  - pension systems and retirement adequacy
  - Health and long-term care infrastructure
- Public asset-based reallocations (and considerations of intergenerational equity)
References

Mason, 2005. Demographic Transition and Demographic Dividends in Developed and Developing Countries. United Nations Expert Group Meeting on Social and Economic Implications of Changing Population Age Structure, Mexico City, 2005

Mason & Lee, 2006. Reform and support systems for the elderly in developing countries: Capturing the second demographic dividend. GENUS, LXII(2), 11–35.


Counting Women’s Work, see website: https://www.countingwomenswork.org/

Please contact Mr Christopher Gee at christopher.gee@nus.edu.sg or Eddie Choo at eddie.choo@nus.edu.sg