National Transfer Accounts and the Demographic Dividend: An Overview

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The First Demographic Dividend

• Fertility decline leads to a rise in the number of workers relative to the number of consumers – a rise in the support ratio.

• Holding the saving rate and output per worker constant, a one percentage point increase in the support ratio leads to a one percentage point increase in per capita consumption.

• The support ratio depends on:
  – Changes in age structure
  – How much people consume and produce by working at each age
The Second Demographic Dividend

- Increase in capital per worker due to
  - decline in number of children
  - longer retirement due to rise in life expectancy
  - shifts in age structure.

- The size of the second dividend depends on
  - Patterns of consumption and work over the lifecycle
  - Extent to which the elderly rely on asset accumulation to fund their retirement
The Second Dividend (continued)

• Increase in human capital due to quantity-quality tradeoff

• Impact depends on
  – Extent to which fertility decline leads to an increase in health, education, nutrition, or other dimensions of human capital
  – Effect of human capital on output
  – Effect of human capital on human capital production of the next generation
Early Estimates of the Dividends

The NTA Flow Account Identity

• Inflows
  – Labor Income
  – Asset Income
  – Transfer Received

• Outflows
  – Consumption
  – Saving
  – Transfers Paid

\[
\begin{align*}
Y^l(a) + Y^a(a) + \tau^+(a) &= C(a) + S(a) + \tau^-(a) \\
C(a) - Y^l(a) &= \tau^+(a) - \tau^-(a) + Y^a(a) - S(a)
\end{align*}
\]

Lifecycle Deficit
Net Transfers
Asset-based Reallocations
Age Reallocations

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A Quick Graphical Description of National Transfer Accounts
Cross-sectional lifecycle flows for South Africa, 2005, per capita

- Includes earnings, labor income from self-employment and value of unpaid family labor
- Public and private consumption of health, education, and other goods and services

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Aggregate Values, South Africa 2005

- Consumption
- Labor income

Age vs. Rand (billions)
Reallocations come in two forms: transfers and asset-based reallocations.
Flows are mediated by public or private institutions.
Reallocations and economic lifecycle must balance.
NTA implies no particular causal connections.

Age reallocations for South Africa, 2005, per capita

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First lesson: Speed of fertility decline will have major impact on DD.

Among the seven African countries in the Gates/NTA study, most rapid fertility decline is anticipated in Ethiopia. If the occurs first dividend will be substantial in Ethiopia.

Ethiopia first dividend: rate of growth of support ratio given alternative fertility scenarios

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Second lesson: In Africa, labor income for young adults is critical DD determinant

Youth employment
- Labor income low on average.
- Leads to low support ratio and smaller first dividend

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Third lesson: Country-specific information is critical

- Tremendous heterogeneity in lifecycle patterns of consumption, labor income, and support systems.
- Greatest is found among low-income and African countries.
- Youth employment serious in Kenya, Ghana, Nigeria, and South Africa.

Labor income by age among African countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Line Color</th>
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<tbody>
<tr>
<td>Ethiopia</td>
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<td>Senegal</td>
<td>Red</td>
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<td>South Africa</td>
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</table>

Proportion of labor income at age 30-49

Age

0 10 20 30 40 50 60 70 80 90+

Proportion of labor income at age 30-49

0.00 0.20 0.40 0.60 0.80 1.00 1.20 1.40
Fourth lesson: Importance of human capital to second dividend

Tradeoff between human capital spending and TFR

- Human capital (% of annual labor income (30-49))
- Total fertility rate

Countries:
- South Africa
- Ghana
- Mozambique
- Nigeria
- Kenya
- Senegal
- E Asia
- SSE Asia
- LA
- Eur US

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## Predicted Q-Q Tradeoff
### African NTA Countries

Percentage increase in human capital investment per child for 2020-25 and 2040-45 for three alternative fertility scenarios.

<table>
<thead>
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<td>47</td>
<td>67</td>
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<td>18</td>
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<td>1</td>
<td>9</td>
<td>18</td>
<td>25</td>
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<tr>
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<td>-1</td>
<td>18</td>
<td>46</td>
<td>8</td>
<td>31</td>
<td>69</td>
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</tbody>
</table>

Note: Percentage change as compared with HK estimate in NTA base year. Constant fertility scenario is not included as it implies no change in human capital spending.
Fifth lesson: Impact of fertility decline on capital can be important even in low-income countries.

• Demand for wealth for lifecycle needs is turning upward
• The upturn would be much sharper if fertility decline were more rapid
• Assets are a very important source of support for elderly in lower income countries – possibly including Africa.
Lifecycle wealth is defined as the wealth required to meet needs in old age with the baseline age profiles of labor income and consumption suitably projected.

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Young elderly are paying more in taxes than they are receiving in publicly-funded benefits.

Older elderly (75+) receive more in publicly-funded benefits than they pay in taxes.

Elderly at all ages give more to their children and grandchildren than they receive.

Elderly rely heavily on assets to meet their old age needs.
# Dividend Estimates

Demographic Dividends, 2010-2050, medium fertility scenario, seven African countries.

Annual growth in income per effective consumer (%).

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<tr>
<th></th>
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<th>Ghana</th>
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<th>Mozambique</th>
<th>Nigeria</th>
<th>Senegal</th>
<th>South Africa</th>
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<tbody>
<tr>
<td>First dividend</td>
<td>0.7</td>
<td>0.6</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
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<td>Second dividend</td>
<td>0.7</td>
<td>0.6</td>
<td>0.8</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Total</td>
<td>1.4</td>
<td>1.2</td>
<td>1.2</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
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</table>

First dividend is the direct impact of the support ratio. The second dividend is the effect of capital deepening on income per capita. Wealth needed to fund old age consumption is calculated assuming that consumption and labor income age profiles shift upward at 3% per year and that the ratio of capital to wealth is constant. A discount rate of 6% is used.
Conclusions

• Great potential for demographic dividends in sub-Saharan Africa

• Realizing that potential depends on
  – Reproductive health policy to realize even medium scenario and if possible to accelerate fertility decline
  – Economic policies that enhance employment conditions for young adults
  – Enhanced public and private human capital spending as fertility declines
  – Improvements in financial markets, investment conditions, and financial literacy

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Future Work

• Complete accounts for African countries
• Improved NTA DD model with both capital and human capital
• Analysis of gender issues incorporating non-market time – childrearing, caregiving to the elderly, etc.
• Analysis of poverty
Notes and acknowledgements

- Ron Lee co-directs the NTA network and collaborated on all of the research reported here.
- South Africa estimates constructed by Morne Oosthuizen, Development Policy Research Unit, University of Capetown.
- Ethiopia estimates constructed by Teferi Mergo.
- Africa regional center led by Olu Ajakaiye, Germano Mwabu, and Adedoyin Soyibo.
Geographic coverage of NTA and current members

<table>
<thead>
<tr>
<th>NTA Members</th>
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<th>Americas</th>
<th>Europe</th>
<th>Africa</th>
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<td>Uruguay</td>
<td>United Kingdom</td>
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NTA network has been supported by many organizations

- Bill and Melinda Gates Foundation
- International Development Research Center (IDRC), Canada
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- European Science Foundation
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