

# 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

## How big are the dividends?

The second has typically been even larger than the first.

### Demographic Dividends: contribution to growth in GDP/N<sup>1</sup>

	First	Second		
Industrial economies	0.34			
East and Southeast Asia	0.59			
South Asia				
Latin America				
Sub-Saharan Africa				0.06
Middle East and North Africa				1.10
Transition economies	0.57	0.81	0.61	
Developing countries	1.15	1.73	0.93	

What have we learned since 2005?

<sup>1</sup>Lee and Mason 2005, "Demographic Transition and Demographic Dividends in Developing Countries," United Nations Expert Group Meeting on Social and Demographic Implications of Changing Population Age Structures (Mexico City).

<sup>2</sup>Annual growth in GDP per effective consumer (GDP/N), 1970–2000, in percent a year. The effective number of consumers is the number of consumers weighted for age variation in consumption needs.

<sup>2</sup>Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, FYR Macedonia, Moldova, Mongolia, Poland, Romania, Russian Federation, Serbia and Montenegro, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Source: Lee and Mason 2006 based on Mason 2005.



# The NTA Flow Account Identity

- Inflows

- Labor Income
- Asset Income
- Transfer Received

- Outflows

- Consumption
- Saving
- Transfers Paid

$$\underbrace{Y^l(a) + Y^a(a) + \tau^+(a)}_{\text{Inflows}} = \underbrace{C(a) + S(a) + \tau^-(a)}_{\text{Outflows}}$$

$$\underbrace{C(a) - Y^l(a)}_{\text{Lifecycle Deficit}} = \underbrace{\tau^+(a) - \tau^-(a)}_{\text{Net Transfers}} + \underbrace{Y^a(a) - S(a)}_{\text{Asset-based Reallocations}}$$

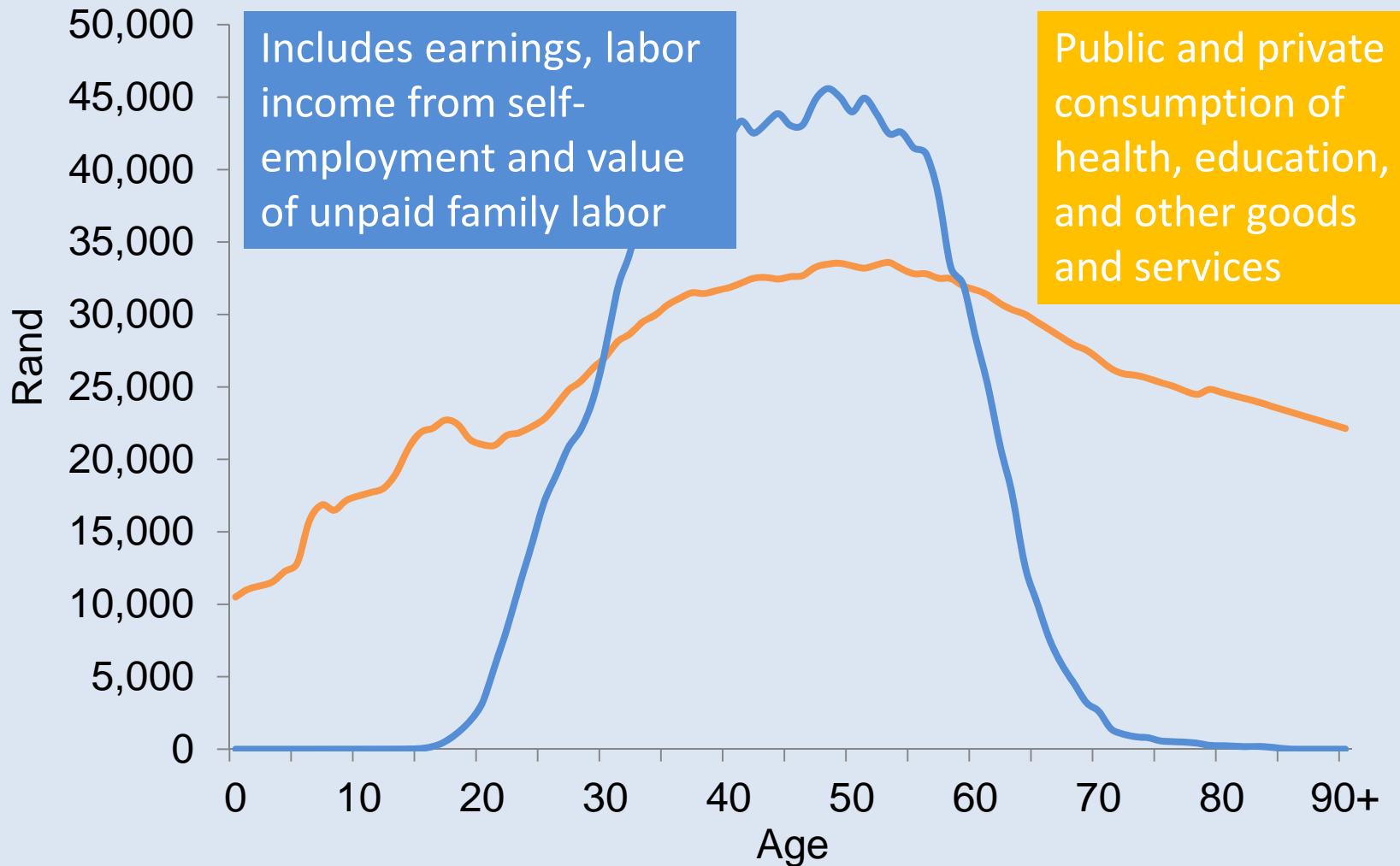
Age Reallocations

# A Quick Graphical Description of National Transfer Accounts

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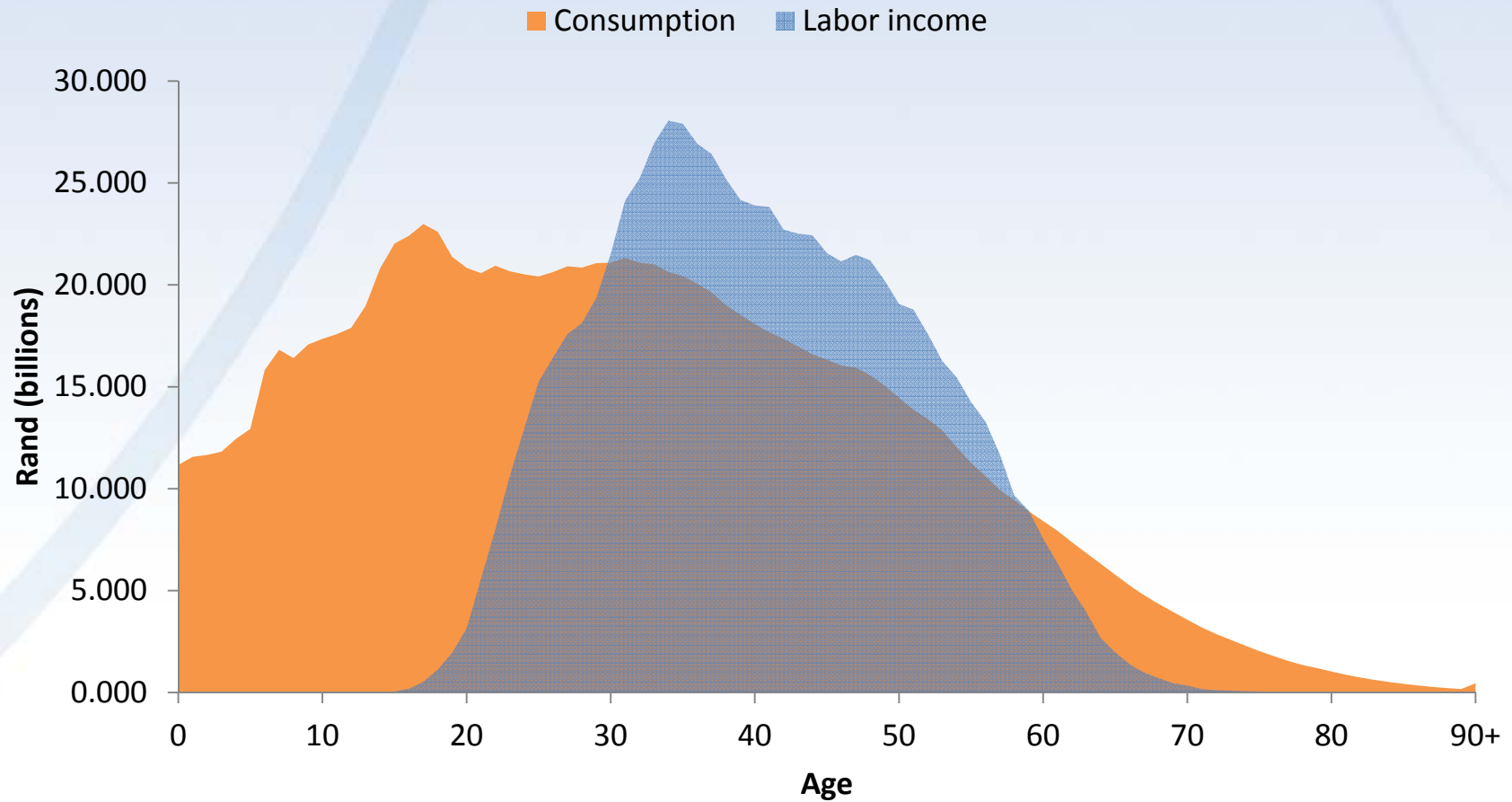
# Cross-sectional lifecycle flows for South Africa, 2005, per capita



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# Aggregate Values, South Africa 2005

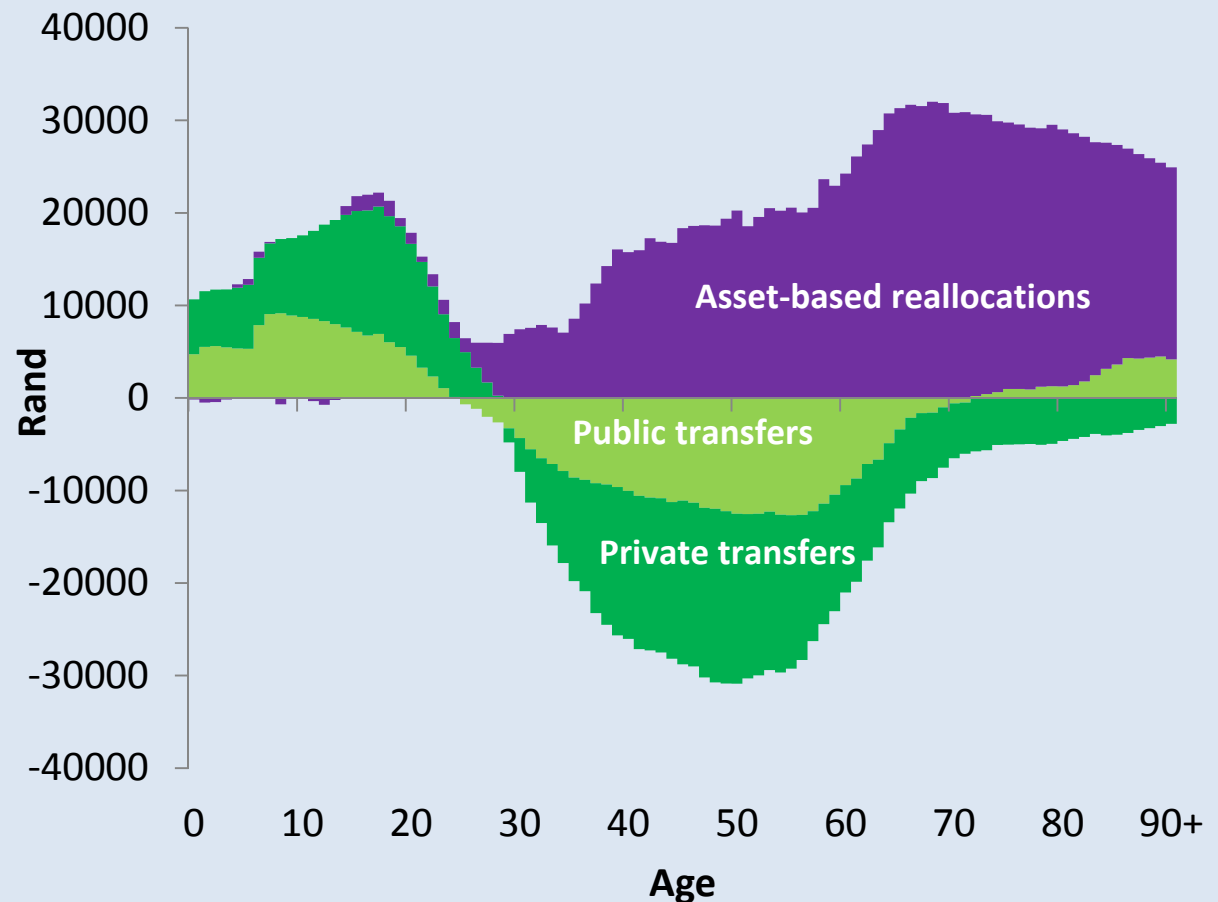


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# Age reallocations for South Africa, 2005, per capita

- 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

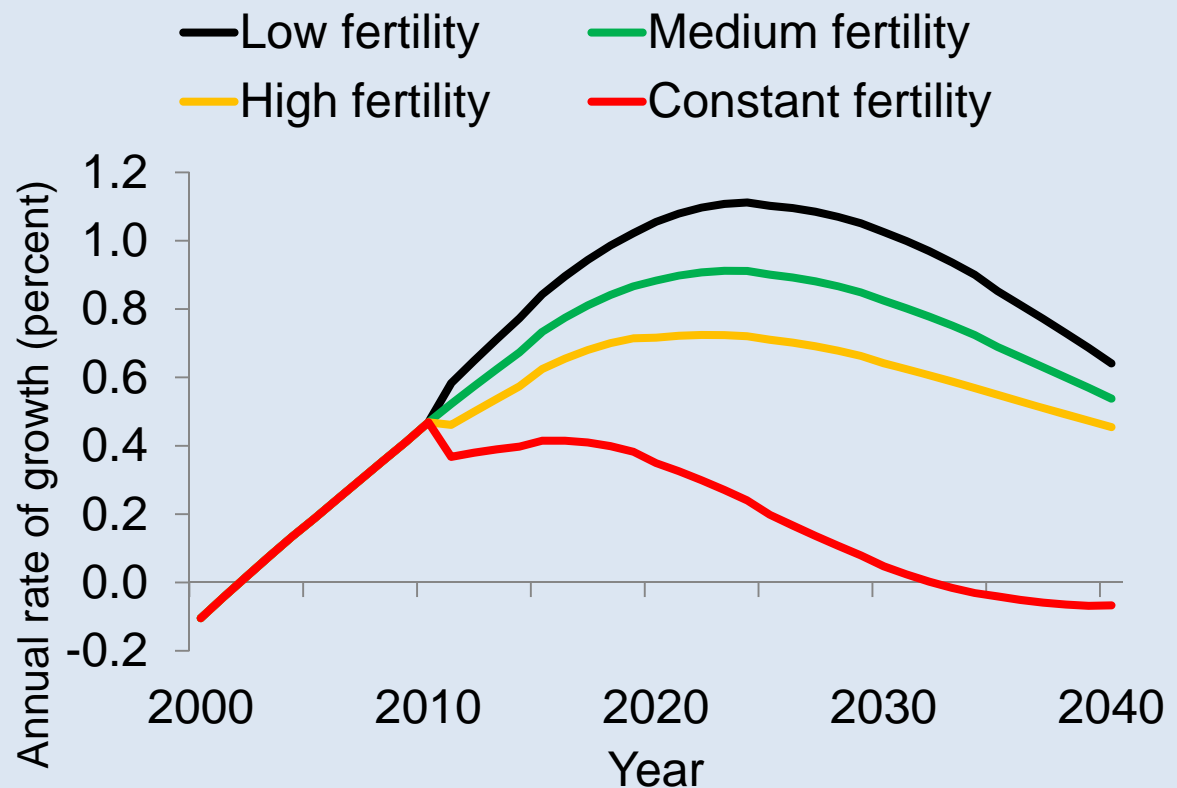


# First lesson: Speed of fertility decline will have major impact on DD.

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

Among the seven African countries in the Gates/NTA study, most rapid fertility decline is anticipated in Ethiopia.

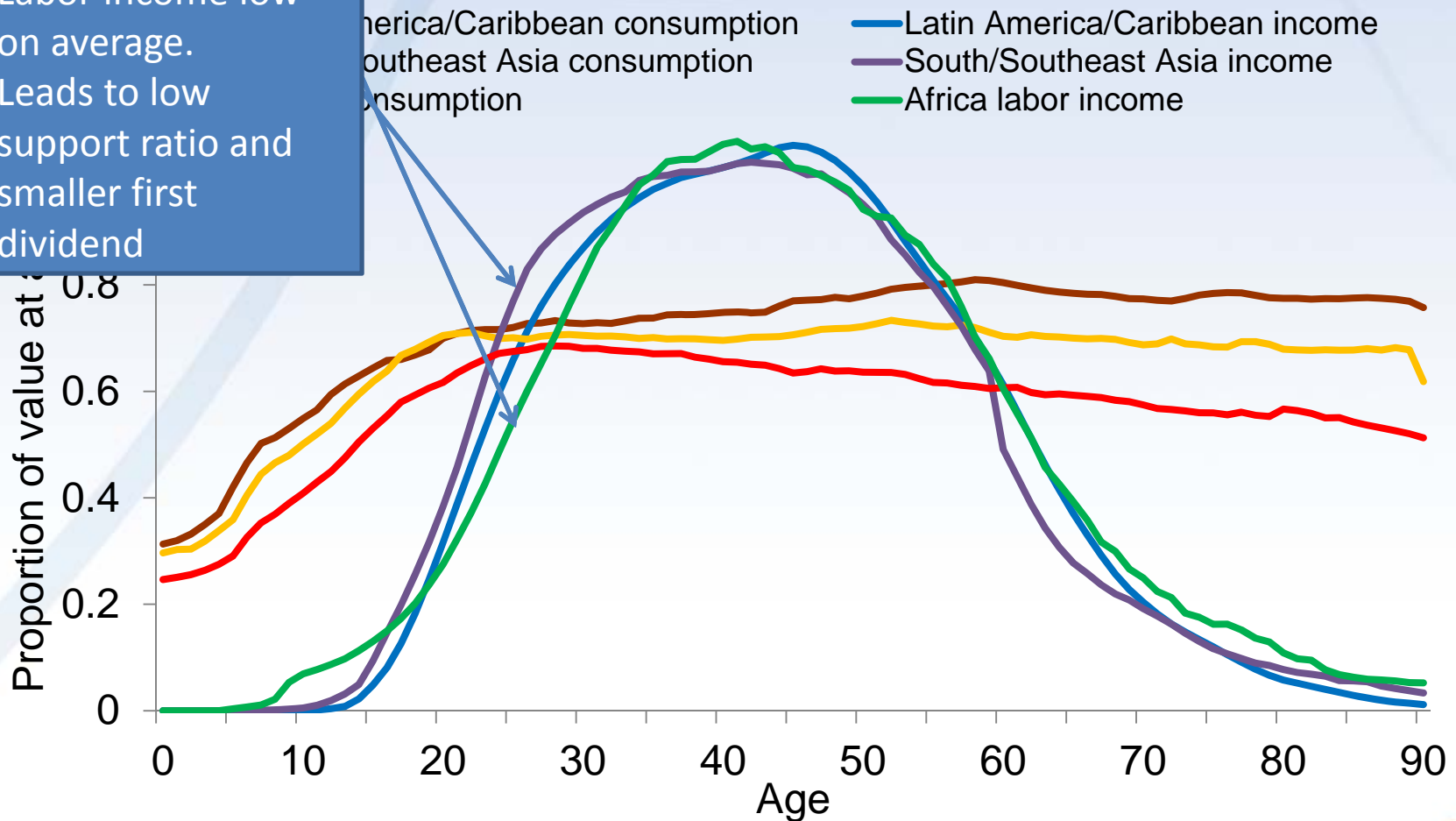
If the occurs first dividend will be substantial in Ethiopia.



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

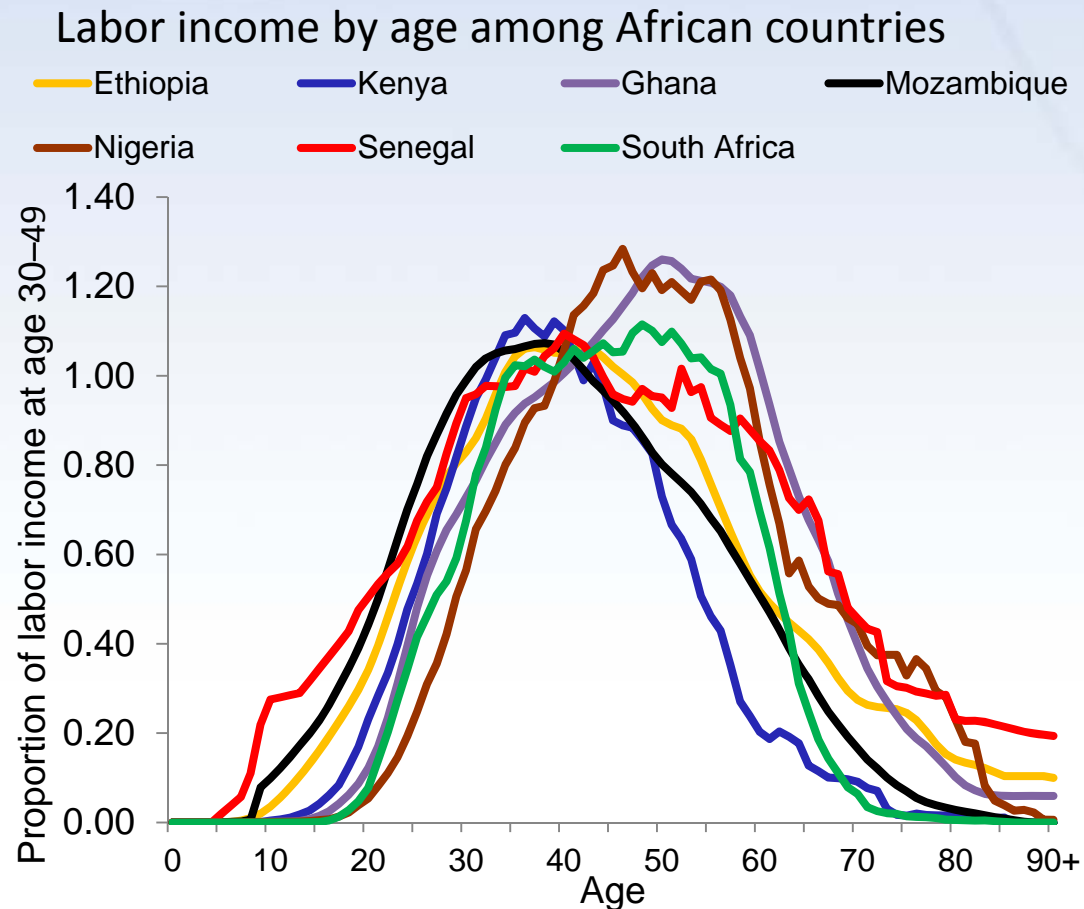
## Youth employment

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



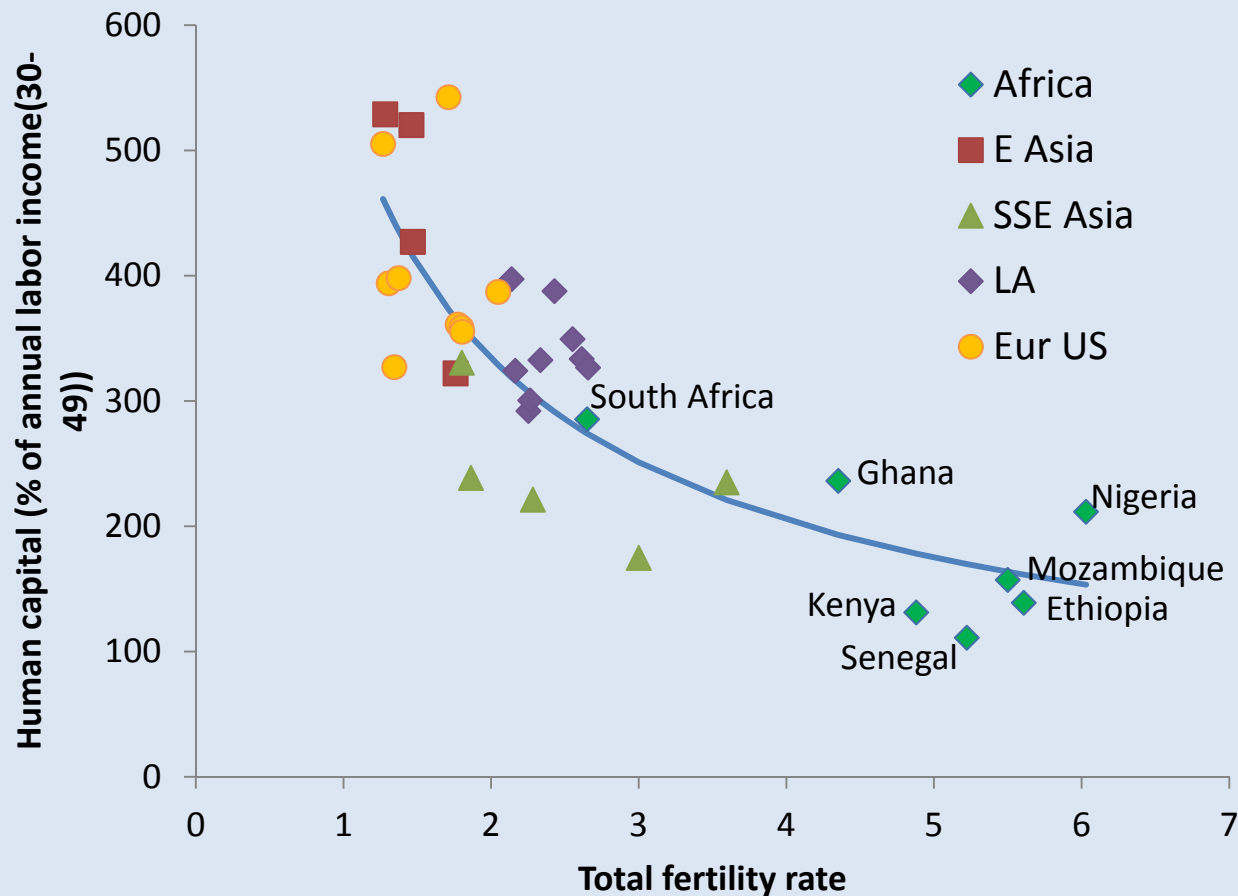
# Third lesson: Country-specific information is critical

- 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.



# Fourth lesson: Importance of human capital to second dividend

Tradeoff between human capital spending and TFR



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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.

	2020-2025			2040-45		
	High	Medium	Low	High	Medium	Low
Ethiopia	32	47	67	71	99	141
Ghana	11	24	42	31	51	79
Kenya	11	23	39	33	51	76
Mozambique	8	18	30	35	52	74
Nigeria	1	9	18	25	38	53
Senegal	7	17	30	29	45	66
South Africa	-1	18	46	8	31	69

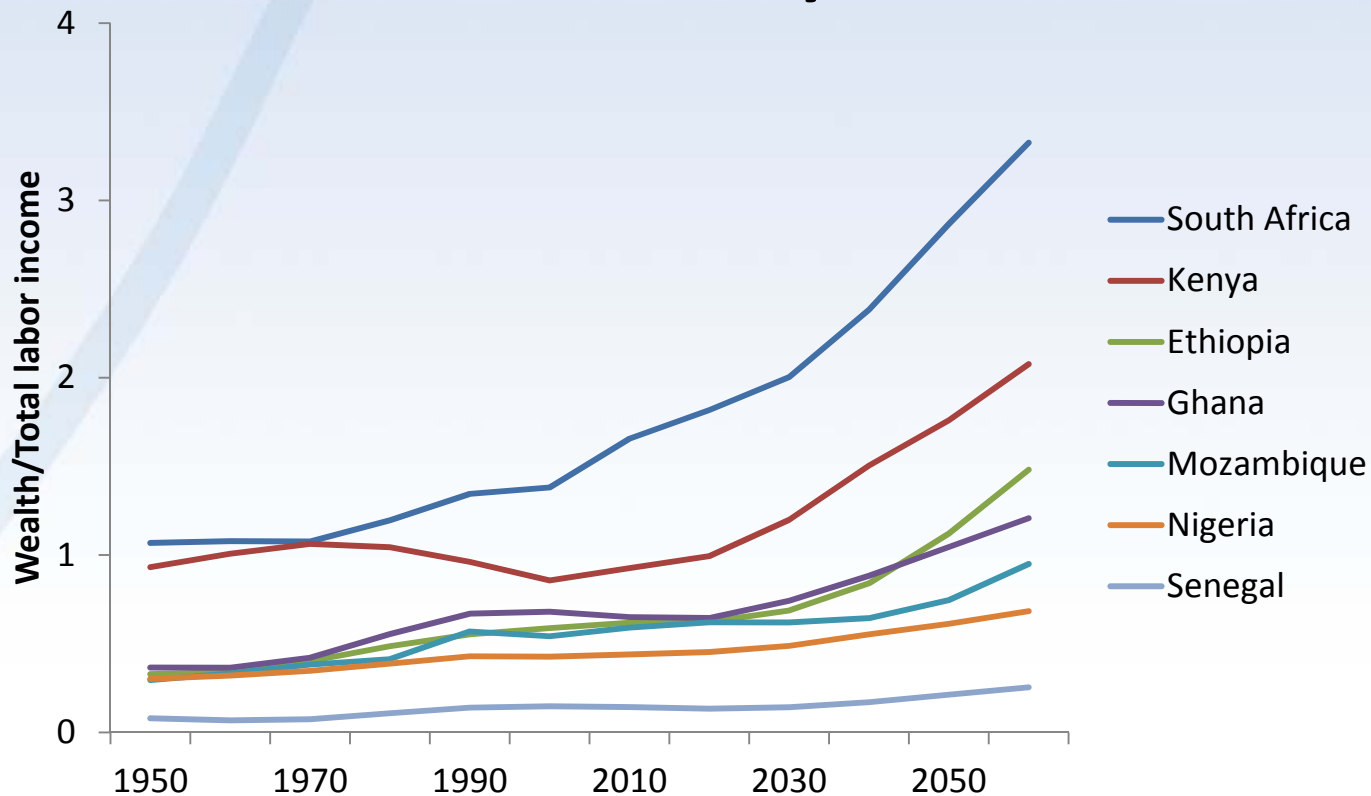
Note: Percentage change as compared with HK estimate in NTA base year. Constant fertility scenario is not included as it implies no change in human capital spending.

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.



# Demand for lifecycle wealth, medium fertility scenario

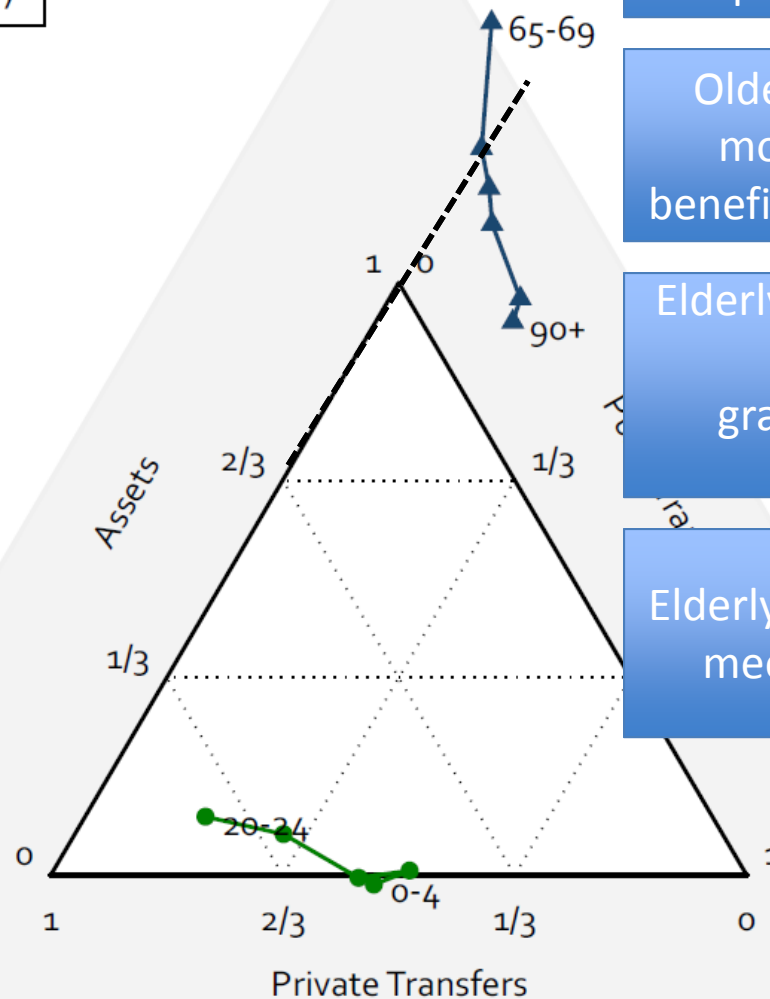
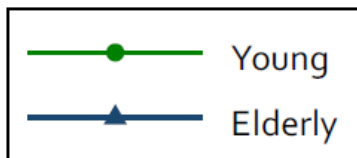


Lifecycle wealth is defined as the wealth required to meet needs in old age with the baseline age profiles of labor income and consumption suitably projected.

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# South Africa Support System



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 (%).

	Ethiopia	Ghana	Kenya	Mozambique	Nigeria	Senegal	South Africa
First dividend	0.7	0.6	0.4	0.3	0.3	0.3	0.2
Second dividend	0.7	0.6	0.8	0.3	0.4	0.5	0.7
Total	1.4	1.2	1.2	0.6	0.7	0.8	0.9

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

# 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

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- Ethiopia estimates constructed by Teferi Mergo.
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# Geographic coverage of NTA and current members

NTA Members			
Asia-Pacific	Americas	Europe	Africa
Australia	Argentina	Austria	Benin
Cambodia	Brazil	Finland	Egypt*
China	Canada	France	Ethiopia*
India	Chile	Germany	Ghana*
Indonesia	Colombia	Hungary	Kenya
Japan	Costa Rica	Italy	Mozambique
Philippines	El Salvador	Poland	Nigeria
South Korea	Jamaica	Slovenia	Senegal
Taiwan	Mexico	Spain	South Africa
Thailand	Peru	Sweden	
Vietnam	United States	Turkey	
	Uruguay	United Kingdom	*Pending

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# NTA network has been supported by many organizations

- Bill and Melinda Gates Foundation
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- UN Population Division
- East-West Center, Hawaii
- Center for the Economics and Demography of Aging, UC Berkeley
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