The quantity-quality tradeoff: a cross-country comparison of market and nonmarket investments per child in relation to fertility

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Project Background

• National Transfer Accounts
  – Disaggregate national accounts by age
  – Understand how societies transfer resources to dependent age groups

• What is missing?
  – National accounts do not include non-market care time production/consumption
  – Inadequate to measure dependency

• Why does it matter?
  – Misestimate economic concepts
  – Leave out much of what women contribute to economies

• Solution: National Time Transfer Accounts
  – NTA framework applied to “household production” satellite accounts
  – Wage imputation on a replacement basis
Example of NTTA contribution: examining evidence of quantity-quality tradeoff

• Quantity-quality tradeoff hypothesis by Becker: fertility decisions not just about number of children to have, but of “quality” as well, and quality costs money
  – Lower fertility would be associated with higher quality

• When the hypothesis is tested on country-level macro data, quality is usually operationalized as:
  – Only educational investments (Barro and Lee 2010)
  – Education + health investments in children (Lee and Mason 2010, Lee and Donehower 2011, Prettner et al. 2013)
  – Consumption of children less their income (Ogawa et al. 2016)

• Extended QQ theory incorporates time costs of children, care provided at home is part of human capital investment
Objective

• Incorporate the unpaid time costs of children into measures of child quality
  – Monetary basis, consistent with market measures
  – Across a diverse set of countries

• Using time use surveys and replacement wage imputation, we quantify the value of childcare in 25 countries, including direct care and children’s share of general household services

• Combine NTA market expenditures per child with NTTA measures of unpaid care time inputs, and explore their relation to fertility in a cross-national comparative context
Data on child quality

• 25 countries, 2000-2010
  – Low and middle-income countries (Africa, Europe, Latin-America): BG, CR, EE, GH, HU, LV, LT, MX, PL, SN, UY, ZA

• Two child quality proxies:
  – Human capital investments per child
    • Public and private market-based education and health costs (NTA)
    • Value of unpaid direct childcare received at home per child (NTTA)
  – Total spending per child
    • Total public and private market-based spending (NTA)
    • Value of unpaid direct childcare and children’s share of general unpaid household services, up to self-supporting age (NTTA)
      (All values normalized by average market labor income age 30-49)
Human capital investment per child: Education + health investments + direct unpaid childcare

Per capita avg relative to annual labour income, 30-49 Age

Note: Average of 25 countries around 2000-2010. Source: Authors’ calculations using NTA estimates from ntaccounts.org & AGENTA and NTTA estimates from AGENTA and CWW.
Total spending per child

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$\ln(\text{hc market}) = 1.84 - 0.77 \times \ln(\text{TFR})$

$\ln(\text{hc childcare}) = 1.57 - 0.56 \times \ln(\text{TFR})$

Education + health investments per child & fertility, replicating Mason et al. (2016)

$R^2 = 0.60, \quad *** \quad p < 0.001$

Standard error for the coefficient estimate: 0.127

Residual standard error: 0.224
\[
\ln(\text{hc market}) = 1.84 - 0.77 \times \ln(\text{TFR})
\]

\[
\ln(\text{hc childcare}) = 1.57 - 0.56 \times \ln(\text{TFR})
\]

\( R^2 = 0.60, \quad *** \quad p < 0.001 \)

Standard error for the coefficient estimate: 0.127
Residual standard error: 0.224

\( R^2 = 0.30, \quad ** \quad p < 0.01 \)

Standard error for the coefficient estimate: 0.169
Residual standard error: 0.299
\[ \ln(\text{hc market}) = 1.84 - 0.77 \times \ln(\text{TFR}) \]

\[ \ln(\text{hc total}) = 2.42 - 0.67 \times \ln(\text{TFR}) \]

\( R^2 = 0.60, \quad *** p < 0.001 \)

Standard error for the coefficient estimate: 0.127
Residual standard error: 0.224

\( R^2 = 0.71, \quad *** p < 0.001 \)

Standard error for the coefficient estimate: 0.088
Residual standard error: 0.155
\[ \ln(\text{care} + \text{other services}) = 2.24 - 0.75 \cdot \ln(\text{TFR}) \]

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Avg relative to annual labour income, 30-49

Total spending per child vs fertility

Spending through market (public + private) per child & fertility, replicating Ogawa et al. (2016)
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Childcare + general household services received at home per child & fertility

\[
\ln(\text{care + other services}) = 2.24 - 0.75 \cdot \ln(\text{TFR})
\]

\[R^2=0.53, \quad *** \ p < 0.001\]

Standard error for the coefficient estimate: 0.146
Residual standard error: 0.259
\[
\ln(\text{care + other services}) = 2.24 - 0.75 \times \ln(\text{TFR})
\]

Spending through market (public + private) per child & fertility, replicating Ogawa et al. (2016)

Total spending per child & fertility

\[
\ln(\text{total spending}) = 3.11 - 0.39 \times \ln(\text{TFR})
\]

\( R^2 = 0.44, \quad *** \ p < 0.001 \)

Standard error for the coefficient estimate: 0.093

Residual standard error: 0.164
Summary

- **Unpaid childcare** received at home is an important and significant part of human capital investments.

- Education and health investment measures combined with direct childcare, and total market + nonmarket spending per child support the quantity-quality tradeoff hypothesis on the country-level.

- Quantity-quality tradeoff operates via both market and nonmarket channels.

- Results relate to policy issues in many areas:
  - Demographic dividends and the “burden of dependency” when changing population age structures change.
  - Costs of childbearing and who pays them.
  - Gender equity.
Thank you!

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