The causal effect of early fertility and marriage on education and employment among young women in Kenya

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Motivation

In Kenya:

- Youths (15-35 years):
  - About 1/3 of Kenya population - 80% of the unemployed

- Female youths:
  - Higher unemployment (vs male) and fewer attain higher levels of education
  - Early transition from school into early child birth and marriage adversely affects
    - women’s human capital accumulation and hence their labor market opportunities

- About 1/4 women give birth and 1/4 marry before 18 years old
**Motivation – literature**

**Previously studied in Kenya:**
Correlates and/or determinants of some of these outcomes independently of one another:

- Effect of education on age at first marriage – Ikamari (2005)
- Effect of education on age at first birth - Ferre (2009)

**Determinants of educational attainment** - Kabubo-Mariara and Mwabu (2007)

**Determinants of youth employment and unemployment** - Escudero and Mourelo, (2013); Vuluku et al. (2013)

**Not addressed in Kenya**
**Simultaneity between** education attainment, age at first birth, age at marriage, and labour force participation - Marchetta and Sahn (2015); Herrera and Sahn (2015); Glick and Sahn (2015)
Objectives

Analyzing the effect of:

1. **Fertility** (total children ever born) on working and working in a decent job among young women, **while controlling for endogeneity**

1. **Early marriage and early fertility** (before 18) on educational attainment of young women
Effect of fertility on working and working in a decent job:

• First, a simple probit model is estimated

• Endogeneity issues:
  o The same unobservable characteristics—such as, individual preferences towards work and children may affect both fertility and employment
  o Women simultaneously decide to have children and to work

• To control: IV probit model

Instrumental variables:

• Infertility shock
• Twin first birth
• Time to water source (community level variable)
Methodology

Effect of early marriage and fertility (before 18) on educational attainment:

• Ordered probit models

• Endogeneity issues:
  o Reverse causality
    Early marriage and child birth adversely affects educational attainment, while educational attainment may delay early child birth and marriage (Schultz, 1997; Kabubo-Mariara et al., 2017).
  o Unobservable factors
    Motivation can affect likelihood of early child/marriage, and also educational attainment

• To control:
  Two-stage residual inclusion and the control function approach models
Effect of early marriage and fertility (before 18) on educational attainment:

Instrumental variables:
- ever had pregnancy terminated
- child before marriage
- number of unions.

• Expected to be highly correlated with early fertility and marriage but not directly related with educational attainment
Data & descriptive statistics

Data: 2014 Kenya demographic and health survey (KDHS)

Stats:

• 51% of the sampled women were working
  ➢ only 32% employed in decent jobs
    i.e. professional/technical/managerial, clerical and/or service sector jobs
• Average 2 children born
• 0.2% of the women were infertile,
• 2% of the first born children were twins
• Average time to water source was 26 minutes
Data: **2014 Kenya demographic and health survey (KDHS)**

Stats:

- **43%** women with children gave birth before 18
- **47%** married women were wed before 18
- **average educational attainment** was primary education - i.e. very low
- **4%** had a pregnancy terminated
- **4%** been in more than one union
- **23%** had married with a child.
### Findings – Effect of fertility on employment

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Marginal effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent variable</td>
<td>Total children ever born</td>
<td>1 if working</td>
</tr>
<tr>
<td>First stage estimates</td>
<td>Probit</td>
<td>ivprobit</td>
</tr>
<tr>
<td></td>
<td>0.007**</td>
<td>-0.086*</td>
</tr>
<tr>
<td></td>
<td>[0.004]</td>
<td>[0.044]</td>
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</table>

**Instrumental variables**

<table>
<thead>
<tr>
<th>Instrumental variables</th>
<th>Coefficients</th>
<th>Marginal effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infertility shock</td>
<td>-0.724***</td>
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<tr>
<td></td>
<td>[0.274]</td>
<td></td>
</tr>
<tr>
<td>Time to water source</td>
<td>0.001***</td>
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<td></td>
<td>[0.000]</td>
<td></td>
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<tr>
<td>Twin first birth</td>
<td>0.840***</td>
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<td></td>
<td>[0.111]</td>
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<tr>
<td>Constant</td>
<td>1.180***</td>
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<td>[0.152]</td>
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<tr>
<td>Observations</td>
<td>14,606</td>
<td>10,807</td>
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<tr>
<td>R-squared</td>
<td>0.466</td>
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</table>
Findings – Effect of fertility on employment

Initial findings:

Increase in number of children = increase 0.7% in likelihood of working

However, after control for endogeneity:

Increase in number of children = reduce chance of working by 8%

- i.e. Endogeneity biases downwards the effect of fertility on employment and also leads to unexpected coefficient sign

Education, wealth index, region, religion are also significant determinants of employment
## Findings – Effect of early fertility/marriage on educational attainment

### Determinants of early fertility and early marriage

<table>
<thead>
<tr>
<th>Variables</th>
<th>Linear probability model</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1 if had a child before 18</td>
<td>1 if married before 18</td>
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<tr>
<td>Instrumental variables</td>
<td></td>
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<tr>
<td>1 if ever had pregnancy terminated</td>
<td>0.0720**</td>
<td>0.1013***</td>
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<td></td>
<td>[0.037]</td>
<td>[0.036]</td>
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<tr>
<td>1 if had a child before marriage</td>
<td>0.1505***</td>
<td>-0.2079***</td>
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<tr>
<td></td>
<td>[0.020]</td>
<td>[0.020]</td>
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<tr>
<td>1 if married more than once</td>
<td>0.2022***</td>
<td>0.2368***</td>
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<tr>
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<tr>
<td>Constant</td>
<td>1.9019***</td>
<td>2.0903***</td>
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<td>[0.135]</td>
<td>[0.132]</td>
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<tr>
<td>Observations</td>
<td>2,229</td>
<td>2,229</td>
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<tr>
<td>R-squared</td>
<td>0.163</td>
<td>0.217</td>
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</tbody>
</table>

First stage estimates:

Instrumental variables all significant

*** p<0.01, ** p<0.05, * p<0.1
Findings – Effect of early fertility/marriage on educational attainment

A child before 18 years:
• Reduces a young woman’s chance of attaining:
  o Primary education by 10 % points
  o Secondary education by 10 % points
  o Tertiary education by 9 % points
• Increases their chance of:
  o Having no formal education by 26 % points.

Married before 18 years:
• Reduces a young woman’s chance of attaining:
  o Primary education by 12 % points
  o Secondary education by 12 % points
  o Tertiary education by 7 % points
• Increases their chance of:
  o Having no formal education by 31 % points.
Failure to control for endogeneity biases downwards the effects of early fertility and marriage on educational attainment.

Wealth index, educational attainment of household head, and religion are other significant determinants of educational attainment.
### Findings – Effect of early fertility/marriage on educational attainment

<table>
<thead>
<tr>
<th>Variables</th>
<th>ordered probit model</th>
<th></th>
<th>Two-stage residual inclusion</th>
<th></th>
<th>Control function approach</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>No formal education</td>
<td>Primary education</td>
<td>Secondary education</td>
<td>Tertiary education</td>
<td>No formal education</td>
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<td>Married before 18</td>
<td>0.134***</td>
<td>-0.052***</td>
<td>-0.052***</td>
<td>-0.030***</td>
<td>0.306***</td>
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<td>[0.011]</td>
<td>[0.005]</td>
<td>[0.005]</td>
<td>[0.003]</td>
<td>[0.067]</td>
<td>[0.027]</td>
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<tr>
<td>Child before 18</td>
<td>0.103***</td>
<td>-0.040***</td>
<td>-0.040***</td>
<td>-0.023***</td>
<td>0.360***</td>
<td>-0.142***</td>
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<td>[0.012]</td>
<td>[0.005]</td>
<td>[0.005]</td>
<td>[0.003]</td>
<td>[0.090]</td>
<td>[0.036]</td>
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<tr>
<td>Married before 18 residuals</td>
<td>-0.163***</td>
<td>0.064**</td>
<td>0.064**</td>
<td>0.035**</td>
<td>-0.205***</td>
<td>0.082***</td>
</tr>
<tr>
<td></td>
<td>[0.069]</td>
<td>[0.027]</td>
<td>[0.028]</td>
<td>[0.015]</td>
<td>[0.076]</td>
<td>[0.031]</td>
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<tr>
<td>Child before 18 residuals</td>
<td>-0.257***</td>
<td>0.102***</td>
<td>0.101***</td>
<td>0.055**</td>
<td>-0.293***</td>
<td>0.118***</td>
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<td>[0.092]</td>
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<td>[0.037]</td>
<td>[0.020]</td>
<td>[0.097]</td>
<td>[0.040]</td>
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<tr>
<td>Interaction of married before 18 and residuals</td>
<td>0.085</td>
<td>-0.034</td>
<td>-0.033</td>
<td>-0.018</td>
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<td>[0.072]</td>
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<td>[0.028]</td>
<td>[0.015]</td>
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<td>0.084</td>
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<td>[0.082]</td>
<td>[0.033]</td>
<td>[0.032]</td>
<td>[0.017]</td>
<td>[0.082]</td>
<td>[0.033]</td>
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</tbody>
</table>
Possible mechanisms to deal with early fertility and marriage for young girls to give opportunity to concentrate on their education

• Enforcement of laws:
  o E.g. Prosecute heavily parents and husbands who participate in early marriage

• Policies that keep girls in school are (against early drop out)
  o Help prevent early transition into child bearing/marriage and related unproductive labour market outcomes.
  o E.g. Subsidize secondary school fees

• Raise awareness on the negative consequences of pre-marital sex on young women.
Thank you!

Project Funding

• Project is part of the Growth and Economic Opportunities for Women - GrOW- program.

• GrOW is a joint initiative by the UK's Department for International Development, The William and Flora Hewlett Foundation, and Canada’s International Development Research Centre (IDRC).

• Program seeks to support policies and interventions that enhance gender equality and societal wellbeing.

• Research is one of the 10 projects that aims to provide solid evidence on ways to tackle the barriers that hold women back from participating equally in the labour market.