The impact of cash transfers on children outcomes in rural Thailand: Evidence from a social pension reform

Tabea Herrmann, Attakrit Leckcivilize and Juliane Zenker

Leibniz University of Hannover and University of Goettingen

01/09/2016
Motivation

Number of social pension receivers and the government budget (1993-2013)

Source: National Economic and Social Development Board of Thailand
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  → Growing concerns on fiscal burdens of the policy
  → Recent debates about returning to targeted programme

What's new in this paper?
- Analysis of pension and child outcomes using panel data
- Study of pension and child outcomes in Thailand
- Among the first few studies to show that a small amount of pension benefit can lead to non-trivial effects
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  → Growing concerns on fiscal burdens of the policy
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  → Growing concerns on fiscal burdens of the policy
  → Recent debates about returning to targeted programme
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013

→ Growing concerns on fiscal burdens of the policy
→ Recent debates about returning to targeted programme
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  - Growing concerns on fiscal burdens of the policy
  - Recent debates about returning to targeted programme

What’s new in this paper?
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  → Growing concerns on fiscal burdens of the policy
  → Recent debates about returning to targeted programme

What’s new in this paper?
- Analysis of pension and child outcomes using panel data
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
  → Growing concerns on fiscal burdens of the policy
  → Recent debates about returning to targeted programme

What’s new in this paper?
- Analysis of pension and child outcomes using panel data
- Study of pension and child outcomes in Thailand
Why should we care about social pension scheme in Thailand?

- Aging society & Old-age poverty / vulnerability
- Around 7.3 million recipients with total budget of 58.35 billion Baht in 2013
- Growing concerns on fiscal burdens of the policy
- Recent debates about returning to targeted programme

What’s new in this paper?
- Analysis of pension and child outcomes using panel data
- Study of pension and child outcomes in Thailand
- Among the first few studies to show that a small amount of pension benefit can lead to non-trivial effects
Literature

- Old-age pension and child outcomes
  - Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
  - Pension increases enrollment and reduces hours worked for girls (Carvalho and Filho, 2012)
  - Pension improves health and nutrition of girls if pension recipient is female (Duflo, 2003)

- Unconditional cash transfers and child outcomes
  - School participation: e.g. Schady and Arujo (2006), Edmonds and Schady (2012), Covarrubias et al. (2012)
  - Child labour: e.g. Akresh et al. (2013), Baird et al. (2011), Covarrubias et al. (2012), Robertson et al. (2013)
Literature

- Old-age pension and child outcomes
Literature

• Old-age pension and child outcomes
  • Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
Old-age pension and child outcomes

- Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
- Pension increases enrollment and reduces hours worked for girls (Carvalho and Filho, 2012) Pension improves health and nutrition of girls if pension recipient is female (Duflo, 2003)
Old-age pension and child outcomes

- Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
- Pension increases enrollment and reduces hours worked for girls (Carvalho and Filho, 2012) Pension improves health and nutrition of girls if pension recipient is female (Duflo, 2003)

Unconditional cash transfers and child outcomes
Old-age pension and child outcomes
- Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
- Pension increases enrollment and reduces hours worked for girls (Carvalho and Filho, 2012) Pension improves health and nutrition of girls if pension recipient is female (Duflo, 2003)

Unconditional cash transfers and child outcomes
- School participation: e.g. Schady and Arujo (2006), Edmonds and Schady (2012), Covarrubias et al. (2012)
• Old-age pension and child outcomes
  • Anticipated pension increases school attendance and reduces hours worked, especially for boys living with male pensioner(s) (Edmonds, 2009)
  • Pension increases enrollment and reduces hours worked for girls (Carvalho and Filho, 2012) Pension improves health and nutrition of girls if pension recipient is female (Duflo, 2003)

Unconditional cash transfers and child outcomes
  • School participation: e.g. Schady and Arujo (2006), Edmonds and Schady (2012), Covarrubias et al. (2012)
  • Child labour: e.g. Akresh et al. (2013), Baird et al. (2011), Covarrubias et al. (2012), Robertson et al. (2013)
Preview of the results

• Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme
• Strong evidence for gender effects
  ⇒ Male (female) pension recipients favoring boys (girls)
  ⇒ Enrollment rates go up only for boys co-residing with newly eligible male (or male and female) pension recipients
  ⇒ Reductions in child work for girls in households with female pensioners
Preview of the results

- Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme.
Preview of the results

- Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme.
- Strong evidence for gender effects.
Preview of the results

- Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme.
- Strong evidence for gender effects:
  - Male (female) pension recipients favoring boys (girls)

⇒ Male (female) pension recipients favoring boys (girls)
Preview of the results

- Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme.
- Strong evidence for gender effects:
  - Male (female) pension recipients favoring boys (girls).
  - Enrollment rates go up only for boys co-residing with newly eligible male (or male and female) pension recipients.
Children in households with pensioners are more likely to enroll in schools and less likely to work either full-time or part-time after the implementation of the universal pension scheme.

Strong evidence for gender effects:
- Male (female) pension recipients favoring boys (girls)
- Enrollment rates go up only for boys co-residing with newly eligible male (or male and female) pension recipients
- Reductions in child work for girls in households with female pensioners
Old-age pension in Thailand

Social pension

A.Leckcivilize
(LUH)

Motivation

Background

Data

Methodology

Results

Robustness

Checks

Conclusion

Old-age pension in Thailand

• 1993 Social pension for elderly poor
• Limited budget (200 Baht per month, later 300 and 500 Baht)
• Giving the poorest seniors in each village
• Decentralizing to local governments around 2001-2002
• After 2009, universal pension for every person older than 60 years old who:
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)
• Stepwise pension system based on age after 2012
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Old-age pension in Thailand

- 1993 Social pension for elderly poor
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
Old-age pension in Thailand

- **1993 Social pension for elderly poor**
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village

- **Decentralizing to local governments around 2001-2002**

- **After 2009, universal pension for every person older than 60 years old who**
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)

- **Stepwise pension system based on age after 2012**
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Old-age pension in Thailand

- **1993 Social pension for elderly poor**
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002

- After 2009, universal pension for every person older than 60 years old who:
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)

- Stepwise pension system based on age after 2012:
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002
- After 2009, universal pension for every person older than 60 years old who:
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002
- After 2009, universal pension for every person older than 60 years old who:
  do not receive any other pensions or salaries from the central or local governments
Old-age pension in Thailand

• 1993 Social pension for elderly poor
  • Limited budget (200 Baht per month, later 300 and 500 Baht)
  • Giving the poorest seniors in each village
  • Decentralizing to local governments around 2001-2002

• After 2009, universal pension for every person older than 60 years old who:
  do not receive any other pensions or salaries from the central or local governments
  register to receive the pension with local authorities (around Nov the year before you turn 60)
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002
- After 2009, universal pension for every person older than 60 years old who:
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)
- Stepwise pension system based on age after 2012:
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Old-age pension in Thailand

• 1993 Social pension for elderly poor
  • Limited budget (200 Baht per month, later 300 and 500 Baht)
  • Giving the poorest seniors in each village
  • Decentralizing to local governments around 2001-2002

• After 2009, universal pension for every person older than 60 years old who:
  do not receive any other pensions or salaries from the central or local governments
  register to receive the pension with local authorities (around Nov the year before you turn 60)

• Stepwise pension system based on age after 2012
  60-69 years old ⇒ 600 Baht per month
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002

- After 2009, universal pension for every person older than 60 years old who:
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)

- Stepwise pension system based on age after 2012
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002

- After 2009, universal pension for every person older than 60 years old who:
  do not receive any other pensions or salaries from the central or local governments
  register to receive the pension with local authorities (around Nov the year before you turn 60)

- Stepwise pension system based on age after 2012
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Old-age pension in Thailand

- 1993 Social pension for elderly poor
  - Limited budget (200 Baht per month, later 300 and 500 Baht)
  - Giving the poorest seniors in each village
  - Decentralizing to local governments around 2001-2002

- After 2009, universal pension for every person older than 60 years old who:
  - do not receive any other pensions or salaries from the central or local governments
  - register to receive the pension with local authorities (around Nov the year before you turn 60)

- Stepwise pension system based on age after 2012
  - 60-69 years old ⇒ 600 Baht per month
  - 70-79 years old ⇒ 700 Baht per month
  - 80-89 years old ⇒ 800 Baht per month
  - 90 years old and older ⇒ 1,000 Baht per month
Education Expenditure in 2009

Table 2.6.2. Household education expenditure in Thailand, by education levels and school type, 2009
(average THB per head per year)

<table>
<thead>
<tr>
<th></th>
<th>Private School</th>
<th></th>
<th></th>
<th></th>
<th>Public School</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tuition Fees</td>
<td>Uniform</td>
<td>Books and equipment</td>
<td>Transport</td>
<td>Tuition Fees</td>
<td>Uniform</td>
<td>Books and equipment</td>
<td>Transport</td>
</tr>
<tr>
<td>Pre-primary</td>
<td>8 703</td>
<td>980</td>
<td>823</td>
<td>3 612</td>
<td>1 546</td>
<td>708</td>
<td>456</td>
<td>2 317</td>
</tr>
<tr>
<td>Primary</td>
<td>11 031</td>
<td>1 315</td>
<td>1 454</td>
<td>4 794</td>
<td>1 976</td>
<td>880</td>
<td>761</td>
<td>2 837</td>
</tr>
<tr>
<td>Lower Secondary</td>
<td>10 894</td>
<td>1 507</td>
<td>1 600</td>
<td>5 022</td>
<td>2 562</td>
<td>1 139</td>
<td>1 122</td>
<td>3 580</td>
</tr>
<tr>
<td>Upper Secondary</td>
<td>23 643</td>
<td>1 430</td>
<td>1 809</td>
<td>5 898</td>
<td>4 615</td>
<td>1 238</td>
<td>1 416</td>
<td>3 927</td>
</tr>
<tr>
<td>Vocational</td>
<td>12 604</td>
<td>1 770</td>
<td>2 303</td>
<td>6 578</td>
<td>4 565</td>
<td>1 443</td>
<td>1 528</td>
<td>4 645</td>
</tr>
<tr>
<td>Tertiary</td>
<td>37 683</td>
<td>1 978</td>
<td>3 346</td>
<td>8 510</td>
<td>14 461</td>
<td>1 636</td>
<td>2 459</td>
<td>6 231</td>
</tr>
<tr>
<td>Informal Education</td>
<td>2 426</td>
<td>692</td>
<td>559</td>
<td>2 418</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13 824</strong></td>
<td><strong>1 272</strong></td>
<td><strong>1 500</strong></td>
<td><strong>5 052</strong></td>
<td><strong>5 120</strong></td>
<td><strong>970</strong></td>
<td><strong>973</strong></td>
<td><strong>3 533</strong></td>
</tr>
</tbody>
</table>

Source: OECD Development Centre’s calculation based on Socio-Economic Survey (SES) data and National Statistical Office (NSO).
Data

• Household survey data
  • Conducted by FOR 756 'Vulnerability in Southeast Asia'
  • Project funded by German Science Foundation
  • Interviewing households in rural areas of the Northeast Thailand
  • Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013

Sample Restriction
• Before (2008) and after reform (2010-2013)
• Children aged 6-18 in 2008 and living in three-generation households
• 1,220 children and 748 households
Data

- Household survey data
Data

- Household survey data
  - Conducted by FOR 756 'Vulnerability in Southeast Asia'
  - Project funded by German Science Foundation
Data

- Household survey data
  - Conducted by FOR 756 'Vulnerability in Southeast Asia' Project funded by German Science Foundation
  - Interviewing households in rural areas of the Northeast Thailand
Household survey data
- Conducted by FOR 756 'Vulnerability in Southeast Asia' Project funded by German Science Foundation
- Interviewing households in rural areas of the Northeast Thailand
- Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013
Data

- **Household survey data**
  - Conducted by FOR 756 'Vulnerability in Southeast Asia’ Project funded by German Science Foundation
  - Interviewing households in rural areas of the Northeast Thailand
  - Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013
- **Sample Restriction**
Data

- Household survey data
  - Conducted by FOR 756 'Vulnerability in Southeast Asia' Project funded by German Science Foundation
  - Interviewing households in rural areas of the Northeast Thailand
  - Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013

- Sample Restriction
  - Before (2008) and after reform (2010  2013)
Data

- **Household survey data**
  - Conducted by FOR 756 'Vulnerability in Southeast Asia' Project funded by German Science Foundation
  - Interviewing households in rural areas of the Northeast Thailand
  - Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013

- **Sample Restriction**
  - Before (2008) and after reform (2010 2013)
  - Children aged 6-18 in 2008 and living in three-generation households
Data

- **Household survey data**
  - Conducted by FOR 756 'Vulnerability in Southeast Asia' Project funded by German Science Foundation
  - Interviewing households in rural areas of the Northeast Thailand
  - Five waves, i.e. 2007, 2008, 2010, 2011 (sub-sample) and 2013

- **Sample Restriction**
  - Before (2008) and after reform (2010 2013)
  - Children aged 6-18 in 2008 and living in three-generation households
  - 1,220 children and 748 households
Table 1: **School enrollment and child work** *(percentage)*

<table>
<thead>
<tr>
<th></th>
<th>Before reform</th>
<th>After reform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2010</td>
</tr>
<tr>
<td><strong>Panel A: Enrollment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children with newly eligible elderly</td>
<td>81.8</td>
<td>82.3</td>
</tr>
<tr>
<td>Children in control group</td>
<td>79.3</td>
<td>77.0</td>
</tr>
<tr>
<td>All boys</td>
<td>79.0</td>
<td>76.3</td>
</tr>
<tr>
<td>All girls</td>
<td>81.7</td>
<td>82.0</td>
</tr>
<tr>
<td><strong>Panel B: Work status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children with newly eligible elderly</td>
<td>9.2</td>
<td>13.5</td>
</tr>
<tr>
<td>Children in control group</td>
<td>9.7</td>
<td>19.7</td>
</tr>
<tr>
<td>All boys</td>
<td>11.0</td>
<td>19.7</td>
</tr>
<tr>
<td>All girls</td>
<td>8.1</td>
<td>14.5</td>
</tr>
</tbody>
</table>

*Note:* School enrollment and work status of children aged 6 to 18 in 2008.
Methodology

• Using Instrumental Variable technique with second stage:

$$y_{it} = \beta_0 + X_{it}' \beta_1 + \beta_2 P_{it} + D_t + \epsilon_{it}$$

• $y_{it}$ be dummies for enrollment or work status of child $i$ at time $t$

• $X_{it}$ is a vector of child and household characteristics
  (1) Age
  (2) Age-squared
  (3) Gender
  (4) Household income
  (5) Size of land owned by the household in 2008
  (6) Years of education of head of HH
  (7) Number of members in following gender-age groups

  ⇒ Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards

• $P_{it}$ is a dummy for pension status which is equal to 1 if child $i$ stayed in a household reporting to receive public pension in period $t$

• $D_t$ are time dummies for two post-reform periods (2010 and 2013)

• $\epsilon_{it}$ are the error terms
Methodology

- Using **Instrumental Variable** technique with second stage:

\[
y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 P_{it} + D_{t} + e_{it}
\]

- \(y_{it}\) be dummies for enrollment or work status of child \(i\) at time \(t\)
- \(X_{it}\) is a vector of child and household characteristics
  1. Age
  2. Age-squared
  3. Gender
  4. Household income
  5. Size of land owned by the household in 2008
  6. Years of education of head of HH
  7. Number of members in following gender-age groups
     - Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards
- \(P_{it}\) is a dummy for pension status which is equal to 1 if child \(i\) stayed in a household reporting to receive public pension in period \(t\)
- \(D_{t}\) are time dummies for two post-reform periods (2010 and 2013)
- \(e_{it}\) are the error terms
Methodology

- Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 \text{Pension}_{it} + D_t + e_{it} \]
Methodology

- Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X'_{it}\beta_1 + \beta_2 Pension_{it} + D_t + e_{it} \]

- \( y_{it} \) be dummies for enrollment or work status of child \( i \) at time \( t \)
Methodology

- Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X_{it}' \beta_1 + \beta_2 Pension_{it} + D_t + e_{it} \]

- \( y_{it} \) be dummies for enrollment or work status of child \( i \) at time \( t \)
- \( X_{it} \) is a vector of child and household characteristics
Methodology

• Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 Pension_{it} + D_t + e_{it} \]

• \( y_{it} \) be dummies for enrollment or work status of child i at time t

• \( X_{it} \) is a vector of child and household characteristics
  (1) Age (2) Age-squared (3) Gender
Methodology

• Using **Instrumental Variable** technique with second stage:

\[
y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 Pension_{it} + D_t + e_{it}
\]

• \( y_{it} \) be dummies for enrollment or work status of child \( i \) at time \( t \)

• \( X_{it} \) is a vector of child and household characteristics
  (1) Age (2) Age-squared (3) Gender
  (4) Household income (5) Size of land owned by the household in 2008 (6) Years of education of head of HH
Methodology

- Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 P_{it} + D_t + e_{it} \]

- \( y_{it} \) be dummies for enrollment or work status of child i at time t
- \( X_{it} \) is a vector of child and household characteristics
  1. Age
  2. Age-squared
  3. Gender
  4. Household income
  5. Size of land owned by the household in 2008
  6. Years of education of head of HH
  7. Number of members in following gender-age groups \( \Rightarrow \) Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards
- \( P_{it} \) is a dummy for pension status which is equal to 1 if child i stayed in a household reporting to receive public pension in period t
- \( D_t \) are time dummies for two post-reform periods (2010 and 2013)
- \( e_{it} \) are the error terms
Methodology

• Using **Instrumental Variable** technique with second stage:

\[
y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 \text{Pension}_{it} + D_t + e_{it}
\]

• \( y_{it} \) be dummies for enrollment or work status of child \( i \) at time \( t \)

• \( X_{it} \) is a vector of child and household characteristics
  (1) Age (2) Age-squared (3) Gender
  (4) Household income (5) Size of land owned by the household in 2008 (6) Years of education of head of HH and (7) Number of members in following gender-age groups ⇒ Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards

• \( \text{Pension}_{it} \) is a dummy for pension status which is equal to 1 if child \( i \) stayed in a household reporting to receive public pension in period \( t \)
Methodology

• Using **Instrumental Variable** technique with second stage:

\[
y_{it} = \beta_0 + X'_{it}\beta_1 + \beta_2 \text{Pension}_{it} + D_t + e_{it}
\]

• \(y_{it}\) be dummies for enrollment or work status of child \(i\) at time \(t\)

• \(X_{it}\) is a vector of child and household characteristics
  (1) Age (2) Age-squared (3) Gender
  (4) Household income (5) Size of land owned by the household in 2008
  (6) Years of education of head of HH and (7) Number of members in following gender-age groups ⇒ Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards

• \(\text{Pension}_{it}\) is a dummy for pension status which is equal to 1 if child \(i\) stayed in a household reporting to receive public pension in period \(t\)

• \(D_t\) are time dummies for two post-reform periods (2010 and 2013)
Methodology

- Using **Instrumental Variable** technique with second stage:

\[ y_{it} = \beta_0 + X_{it}'\beta_1 + \beta_2 Pension_{it} + D_t + e_{it} \]

- \( y_{it} \) be dummies for enrollment or work status of child i at time t
- \( X_{it} \) is a vector of child and household characteristics
  1. Age 
  2. Age-squared 
  3. Gender 
  4. Household income 
  5. Size of land owned by the household in 2008 
  6. Years of education of head of HH 
  7. Number of members in following gender-age groups ⇒ Five-year interval of age from 0-4, 5-9, ..., 55-59, 60-64 to 65-69, then with ten-year interval for 70-79, 80-89 and 90 years old onwards
- \( Pension_{it} \) is a dummy for pension status which is equal to 1 if child i stayed in a household reporting to receive public pension in period t
- \( D_t \) are time dummies for two post-reform periods (2010 and 2013)
- \( e_{it} \) are the error terms
Methodology cont.

First stage:

\[ \text{Pension it} = \alpha_0 + X'_{it} \alpha_1 + \alpha_2 \text{PenAge}_{it} + \alpha_3 \text{PenAge}_{70} + \alpha_4 \text{PenAge}_{80} + \alpha_5 \text{PenAge}_{90} + D_t + \epsilon_{it} \]

• using \( \text{PenAge}_{it}, \text{PenAge}_{70}, \text{PenAge}_{80} \) and \( \text{PenAge}_{90} \) as an instrument for Pension status (\( \text{Pension it} \))

• where \( \text{PenAge}_{it} \) is a dummy variable equal to 1 if child \( i \) stayed in a household with senior citizen(s), i.e. older than 60 after 2010

• \( \text{PenAge}_{70}, \text{PenAge}_{80}, \text{PenAge}_{90} \) are dummy variables for child \( i \) in a household with senior citizen(s) aged 70-79, 80-89 and 90 and older in 2013 respectively

Reduced form:

\[ y_{it} = \delta_0 + X'_{it} \delta_1 + \delta_2 \text{PenAge}_{it} + \delta_3 \text{PenAge}_{70} + \delta_4 \text{PenAge}_{80} + \delta_5 \text{PenAge}_{90} + D_t + \epsilon_{it} \]
Methodology cont.

First stage:

\[ \text{Pension}_{it} = \alpha_0 + X'_{it} \alpha_1 + \alpha_2 \text{PenAge}_{it} + \alpha_3 \text{PenAge}_{70it} + \alpha_4 \text{PenAge}_{80it} + \alpha_5 \text{PenAge}_{90it} + D_t + \epsilon_{it} \]

\[ \text{Pension}_{it} \] is expected to endogenously affect \( X'_{it} \), and \( X'_{it} \) may be endogenous to \( \text{Pension}_{it} \). We use \( \text{PenAge}_{it} \), \( \text{PenAge}_{70it} \), \( \text{PenAge}_{80it} \) and \( \text{PenAge}_{90it} \) as instruments for \( \text{Pension}_{it} \).

Reduced form:

\[ y_{it} = \delta_0 + X'_{it} \delta_1 + \delta_2 \text{PenAge}_{it} + \delta_3 \text{PenAge}_{70it} + \delta_4 \text{PenAge}_{80it} + \delta_5 \text{PenAge}_{90it} + D_t + \epsilon_{it} \]
**Methodology cont.**

**First stage:**

$$\text{Pension}_{it} = \alpha_0 + \mathbf{X}'_{it} \alpha_1 + \alpha_2 \text{PenAge}_{it} + \alpha_3 \text{PenAge70}_{it}$$

$$+ \alpha_4 \text{PenAge80}_{it} + \alpha_5 \text{PenAge90}_{it} + D_t + u_t$$
Methodology cont.

First stage:

\[
Pension_{it} = \alpha_0 + X_{it}' \alpha_1 + \alpha_2 PenAge_{it} + \alpha_3 PenAge70_{it} \\
+ \alpha_4 PenAge80_{it} + \alpha_5 PenAge90_{it} + D_t + u_t
\]

- using \( PenAge_{it}, PenAge70_{it}, PenAge80_{it} \) and \( PenAge90_{it} \) as an instrument for Pension status (**Pension**\( _{it} \))
Methodology cont.

First stage:

\[ \text{Pension}_{it} = \alpha_0 + X'_{it} \alpha_1 + \alpha_2 \text{PenAge}_{it} + \alpha_3 \text{PenAge70}_{it} \]
\[ + \alpha_4 \text{PenAge80}_{it} + \alpha_5 \text{PenAge90}_{it} + D_t + u_t \]

- using \( \text{PenAge}_{it} \), \( \text{PenAge70}_{it} \), \( \text{PenAge80}_{it} \) and \( \text{PenAge90}_{it} \) as an instrument for Pension status (\( \text{Pension}_{it} \))
- where \( \text{PenAge}_{it} \) is a dummy variable equal to 1 if child \( i \) stayed in a household with senior citizen(s), i.e. older than 60 after 2010
Methodology cont.

First stage:

\[ \text{Pension}_{it} = \alpha_0 + \mathbf{X}'_{it} \alpha_1 + \alpha_2 \text{PenAge}_{it} + \alpha_3 \text{PenAge70}_{it} + \alpha_4 \text{PenAge80}_{it} + \alpha_5 \text{PenAge90}_{it} + D_t + u_t \]

- using \( \text{PenAge}_{it}, \text{PenAge70}_{it}, \text{PenAge80}_{it} \) and \( \text{PenAge90}_{it} \) as an instrument for Pension status (\( \text{Pension}_{it} \))
- where \( \text{PenAge}_{it} \) is a dummy variable equal to 1 if child \( i \) stayed in a household with senior citizen(s), i.e. older than 60 after 2010
- \( \text{PenAge70}_{it}, \text{PenAge80}_{it} \) and \( \text{PenAge90}_{it} \) are dummy variables for child \( i \) in a household with senior citizen(s) aged 70-79, 80-89 and 90 and older in 2013 respectively
First stage:

\[ Pension_{it} = \alpha_0 + X'_{it} \alpha_1 + \alpha_2 PenAge_{it} + \alpha_3 PenAge70_{it} \]
\[ + \alpha_4 PenAge80_{it} + \alpha_5 PenAge90_{it} + D_t + u_t \]

- using \( PenAge_{it} \), \( PenAge70_{it} \), \( PenAge80_{it} \) and \( PenAge90_{it} \) as an instrument for Pension status (\( Pension_{it} \))
- where \( PenAge_{it} \) is a dummy variable equal to 1 if child \( i \) stayed in a household with senior citizen(s), i.e. older than 60 after 2010
- \( PenAge70_{it} \), \( PenAge80_{it} \) and \( PenAge90_{it} \) are dummy variables for child \( i \) in a household with senior citizen(s) aged 70-79, 80-89 and 90 and older in 2013 respectively

Reduced form:
**Methodology cont.**

**First stage:**

\[
Pension_{it} = \alpha_0 + X'_{it} \alpha_1 + \alpha_2 PenAge_{it} + \alpha_3 PenAge70_{it} + \alpha_4 PenAge80_{it} + \alpha_5 PenAge90_{it} + D_t + u_t
\]

- using \( PenAge_{it} \), \( PenAge70_{it} \), \( PenAge80_{it} \) and \( PenAge90_{it} \) as an instrument for Pension status (\( Pension_{it} \))
- where \( PenAge_{it} \) is a dummy variable equal to 1 if child \( i \) stayed in a household with senior citizen(s), i.e. older than 60 after 2010
- \( PenAge70_{it} \), \( PenAge80_{it} \) and \( PenAge90_{it} \) are dummy variables for child \( i \) in a household with senior citizen(s) aged 70-79, 80-89 and 90 and older in 2013 respectively

**Reduced form:**

\[
y_{it} = \delta_0 + X'_{it} \delta_1 + \delta_2 PenAge_{it} + \delta_3 PenAge70_{it} + \delta_4 PenAge80_{it} + \delta_5 PenAge90_{it} + D_t + \epsilon_{it}
\]
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X_{it}' \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + \nu_{it} \]

- \( y_{it} \), \( X_{it} \), \( \nu_{it} \) are the same as before
- \( \text{PenF} \) a dummy variable equal to one if the household has female pensioner(s)
- \( \text{PenMF} \) for households with both female and male pensioners
- Then estimate the model in separate regressions by gender
- \( \nu_{it} \) are the error terms
- For the first stage, interacting \( \text{PenAge} \) with dummy variables for households with female and both male and female pensioners → Use them as instrumental variables for \( \text{PenF} \) and \( \text{PenMF} \) respectively
Methodology cont.

Effects by genders:
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + \mathbf{X}_{it}' \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X'_{it} \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X_{it}' \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
- \( \text{PenF} \) a dummy variable equal to one if the household has female pensioner(s)
Methodology cont.

**Effects by genders:**

\[ y_{it} = \theta_0 + X_{it}' \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
- \( \text{PenF} \) a dummy variable equal to one if the household has female pensioner(s)
- \( \text{PenMF} \) for households with both female and male pensioners
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + \mathbf{X}_{it}' \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]

- \( y_{it} \), \( \mathbf{X}_{it} \), \( D_t \) are the same as before
- \( \text{PenF} \) a dummy variable equal to one if the household has female pensioner(s)
- \( \text{PenMF} \) for households with both female and male pensioners
- Then estimate the model in separate regressions by gender of children in the household

• For the first stage, interacting PenAge with dummy variables for households with female and both male and female pensioners
→ Use them as instrumental variables for \( \text{PenF} \) and \( \text{PenMF} \) respectively
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X_{it}' \theta_1 + \theta_2 Pension_{it} + \theta_3 PenF_{it} + \theta_4 PenMF_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
- \( PenF \) a dummy variable equal to one if the household has female pensioner(s)
- \( PenMF \) for households with both female and male pensioners
- Then estimate the model in separate regressions by gender of children in the household
- \( \nu_{it} \) are the error terms
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X'_{it} \theta_1 + \theta_2 \text{Pension}_{it} + \theta_3 \text{PenF}_{it} + \theta_4 \text{PenMF}_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
- \( \text{PenF} \) a dummy variable equal to one if the household has female pensioner(s)
- \( \text{PenMF} \) for households with both female and male pensioners
- Then estimate the model in separate regressions by gender of children in the household
- \( \nu_{it} \) are the error terms
- For the first stage, interacting \( \text{PenAge} \) with dummy variables for households with female and both male and female pensioners
Methodology cont.

Effects by genders:

\[ y_{it} = \theta_0 + X_{it}' \theta_1 + \theta_2 Pension_{it} + \theta_3 PenF_{it} + \theta_4 PenMF_{it} + D_t + \nu_{it} \]

- \( y_{it}, X_{it}, D_t \) are the same as before
- \( PenF \) a dummy variable equal to one if the household has female pensioner(s)
- \( PenMF \) for households with both female and male pensioners
- Then estimate the model in separate regressions by gender of children in the household
- \( \nu_{it} \) are the error terms
- For the first stage, interacting \( PenAge \) with dummy variables for households with female and both male and female pensioners
  - Use them as instrumental variables for \( PenF \) and \( PenMF \) respectively
### Results: All sample

#### Table 2: The effect of the social pension on child work: Reduced form and 2SLS

<table>
<thead>
<tr>
<th></th>
<th>Reduced form</th>
<th></th>
<th></th>
<th></th>
<th>2SLS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6-18</td>
<td>6-11</td>
<td>12-18</td>
<td>6-18</td>
<td>6-11</td>
<td>12-18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible HH</td>
<td>-0.062***</td>
<td>-0.024</td>
<td>-0.105***</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.022)</td>
<td>(0.035)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pension HH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.136***</td>
<td>-0.047</td>
<td>-0.226***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.051)</td>
<td>(0.049)</td>
<td>(0.075)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>-0.041***</td>
<td>-0.025**</td>
<td>-0.052*</td>
<td>-0.041****</td>
<td>-0.025**</td>
<td>-0.049*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.012)</td>
<td>(0.027)</td>
<td>(0.015)</td>
<td>(0.012)</td>
<td>(0.027)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.095***</td>
<td>-0.020</td>
<td>0.019</td>
<td>-0.095***</td>
<td>-0.019</td>
<td>0.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.014)</td>
<td>(0.035)</td>
<td>(0.008)</td>
<td>(0.014)</td>
<td>(0.036)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age^2</td>
<td>0.005***</td>
<td>0.001*</td>
<td>0.002**</td>
<td>0.005***</td>
<td>0.001*</td>
<td>0.003**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.000)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total HH income</td>
<td>-0.028***</td>
<td>-0.017***</td>
<td>-0.031**</td>
<td>-0.027***</td>
<td>-0.016***</td>
<td>-0.033***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.012)</td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land area 2008</td>
<td>-0.002</td>
<td>0.003*</td>
<td>-0.006**</td>
<td>-0.001</td>
<td>0.003*</td>
<td>-0.005*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edu of HH head</td>
<td>-0.005*</td>
<td>-0.002</td>
<td>-0.010*</td>
<td>-0.008**</td>
<td>-0.003</td>
<td>-0.013**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>46.6</td>
<td>38.4</td>
<td>34.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R^2</td>
<td>0.381</td>
<td>0.067</td>
<td>0.341</td>
<td>0.364</td>
<td>0.055</td>
<td>0.309</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>3,387</td>
<td>1,570</td>
<td>1,817</td>
<td>3,387</td>
<td>1,570</td>
<td>1,817</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level. All models control for Household composition.
### Results: Education by genders

Table 3: The effect of the social pension on school enrollment by gender: 2SLS

<table>
<thead>
<tr>
<th></th>
<th>6-18</th>
<th></th>
<th>6-11</th>
<th></th>
<th>12-18</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>Male Recipient</td>
<td>0.178</td>
<td>-0.002</td>
<td>-0.066</td>
<td>-0.219</td>
<td>0.404**</td>
<td>0.174</td>
</tr>
<tr>
<td></td>
<td>(0.127)</td>
<td>(0.150)</td>
<td>(0.159)</td>
<td>(0.165)</td>
<td>(0.167)</td>
<td>(0.247)</td>
</tr>
<tr>
<td>ΔFemaleReci</td>
<td>-0.153</td>
<td>0.035</td>
<td>0.017</td>
<td>0.226</td>
<td>-0.256</td>
<td>-0.047</td>
</tr>
<tr>
<td></td>
<td>(0.163)</td>
<td>(0.169)</td>
<td>(0.170)</td>
<td>(0.210)</td>
<td>(0.240)</td>
<td>(0.261)</td>
</tr>
<tr>
<td>ΔMale + FemaleReci</td>
<td>0.107</td>
<td>-0.105</td>
<td>0.004</td>
<td>-0.136</td>
<td>0.152</td>
<td>-0.091</td>
</tr>
<tr>
<td></td>
<td>(0.102)</td>
<td>(0.096)</td>
<td>(0.120)</td>
<td>(0.124)</td>
<td>(0.140)</td>
<td>(0.140)</td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>36.7</td>
<td>21.5</td>
<td>8.9</td>
<td>11.4</td>
<td>20.1</td>
<td>10.0</td>
</tr>
<tr>
<td>R²</td>
<td>0.355</td>
<td>0.378</td>
<td>0.395</td>
<td>0.374</td>
<td>0.314</td>
<td>0.382</td>
</tr>
<tr>
<td>Observations</td>
<td>1662</td>
<td>1723</td>
<td>793</td>
<td>775</td>
<td>869</td>
<td>948</td>
</tr>
<tr>
<td>Child and HH vars</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>HH composition</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Female Reci</td>
<td>0.023</td>
<td>0.033</td>
<td>-0.049</td>
<td>0.010</td>
<td>0.142</td>
<td>0.126</td>
</tr>
<tr>
<td></td>
<td>(0.103)</td>
<td>(0.068)</td>
<td>(0.099)</td>
<td>(0.087)</td>
<td>(0.162)</td>
<td>(0.096)</td>
</tr>
<tr>
<td>Male + Female Reci</td>
<td>0.129</td>
<td>-0.072</td>
<td>-0.044</td>
<td>-0.125</td>
<td>0.295**</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>(0.104)</td>
<td>(0.089)</td>
<td>(0.136)</td>
<td>(0.103)</td>
<td>(0.142)</td>
<td>(0.135)</td>
</tr>
</tbody>
</table>

Note: ΔFemale(Male + Female)Recipient measures the additional effect if a woman (men and women) receives the pension after becoming eligible due to the reform compared to a men (the individual effects of a men and woman).
## Results: Child work by genders

### Table 4: The effect of the social pension on child work by gender: 2SLS

<table>
<thead>
<tr>
<th></th>
<th>6-18 Boys</th>
<th>6-18 Girls</th>
<th>6-11 Boys</th>
<th>6-11 Girls</th>
<th>12-18 Boys</th>
<th>12-18 Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male Recipient</strong></td>
<td>-0.154</td>
<td>-0.069</td>
<td>-0.138</td>
<td>0.063</td>
<td>-0.219</td>
<td>-0.187</td>
</tr>
<tr>
<td><strong>Female Recipient</strong></td>
<td>0.015</td>
<td>-0.104</td>
<td>0.058</td>
<td>-0.140</td>
<td>0.002</td>
<td>-0.068</td>
</tr>
<tr>
<td><strong>Male + Female Reci</strong></td>
<td>-0.000</td>
<td>0.070</td>
<td>-0.097</td>
<td>0.015</td>
<td>0.037</td>
<td>0.107</td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>36.7</td>
<td>21.5</td>
<td>8.9</td>
<td>11.4</td>
<td>20.1</td>
<td>10.0</td>
</tr>
<tr>
<td>R²</td>
<td>0.388</td>
<td>0.345</td>
<td>0.077</td>
<td>0.060</td>
<td>0.333</td>
<td>0.303</td>
</tr>
<tr>
<td>Observations</td>
<td>1662</td>
<td>1723</td>
<td>793</td>
<td>775</td>
<td>869</td>
<td>948</td>
</tr>
<tr>
<td><strong>Child and family vars</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Year dummies</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>HH composition</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Female Reci</strong></td>
<td>-0.137</td>
<td>-0.173**</td>
<td>-0.079</td>
<td>-0.078</td>
<td>-0.214</td>
<td>-0.255***</td>
</tr>
<tr>
<td><strong>Male + Female Reci</strong></td>
<td>-0.136</td>
<td>-0.103</td>
<td>-0.174</td>
<td>-0.063</td>
<td>-0.178</td>
<td>-0.148</td>
</tr>
</tbody>
</table>

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
## Results: Education expenditure

### Table 5: The effect of the social pension on education expenditure

<table>
<thead>
<tr>
<th></th>
<th>Log Share (All)</th>
<th>Share (All)</th>
<th>Log Share (Genders)</th>
<th>Share (Genders)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension HH</td>
<td>0.619</td>
<td>0.030*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.396)</td>
<td>(0.017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Recipient</td>
<td>-</td>
<td>-</td>
<td>1.230*</td>
<td>0.049*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.738)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>HH income (lagged)</td>
<td>0.281***</td>
<td>0.001</td>
<td>0.267***</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
<td>(0.003)</td>
<td>(0.088)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Land area in 2008</td>
<td>0.050***</td>
<td>0.000</td>
<td>0.050***</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.001)</td>
<td>(0.012)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Education of HH head</td>
<td>0.082***</td>
<td>0.002**</td>
<td>0.082***</td>
<td>0.002**</td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.001)</td>
<td>(0.031)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>( \Delta ) Female Recipient</td>
<td>-</td>
<td>-</td>
<td>-1.029</td>
<td>-0.033</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.862)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>( \Delta ) Male + Female Recipient</td>
<td>-</td>
<td>-</td>
<td>0.168</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.519)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>56</td>
<td>56</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.165</td>
<td>0.082</td>
<td>0.164</td>
<td>0.081</td>
</tr>
<tr>
<td>Observations</td>
<td>2,121</td>
<td>2,121</td>
<td>2,120</td>
<td>2,120</td>
</tr>
<tr>
<td>Control vars</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Female Recipient</td>
<td></td>
<td></td>
<td>0.193</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.474)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Male + Female Recipient</td>
<td></td>
<td></td>
<td>0.354</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.527)</td>
<td>(0.022)</td>
</tr>
</tbody>
</table>

*Note: Pension HH indicates whether a household member receives the pension after becoming eligible due to the reform.*
### Results: Other expenditures

#### Table 6: The effect of the social pension on other expenditures

<table>
<thead>
<tr>
<th></th>
<th>Total (Log)</th>
<th>Food (Log)</th>
<th>Food (Share)</th>
<th>Non food (Log)</th>
<th>Non food (Share)</th>
<th>Health (Log)</th>
<th>Health (Share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension HH</td>
<td>-0.127</td>
<td>-0.106</td>
<td>0.001</td>
<td>-0.177</td>
<td>-0.032</td>
<td>-0.341</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>(0.101)</td>
<td>(0.098)</td>
<td>(0.028)</td>
<td>(0.139)</td>
<td>(0.028)</td>
<td>(0.375)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>HH income (lagged)</td>
<td>0.194***</td>
<td>0.155***</td>
<td>-0.020***</td>
<td>0.253***</td>
<td>0.020***</td>
<td>0.075</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.006)</td>
<td>(0.026)</td>
<td>(0.005)</td>
<td>(0.078)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Land area 2008</td>
<td>0.021***</td>
<td>0.018**</td>
<td>-0.001</td>
<td>0.025***</td>
<td>0.001</td>
<td>0.019</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.001)</td>
<td>(0.007)</td>
<td>(0.001)</td>
<td>(0.014)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Edu of HH head</td>
<td>0.040***</td>
<td>0.025***</td>
<td>-0.006***</td>
<td>0.051***</td>
<td>0.004**</td>
<td>0.054**</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.002)</td>
<td>(0.009)</td>
<td>(0.002)</td>
<td>(0.024)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>R²</td>
<td>0.252</td>
<td>0.261</td>
<td>0.153</td>
<td>0.179</td>
<td>0.086</td>
<td>0.040</td>
<td>0.034</td>
</tr>
<tr>
<td>Obs</td>
<td>2,121</td>
<td>2,121</td>
<td>2,121</td>
<td>2,121</td>
<td>2,121</td>
<td>2,121</td>
<td>2,121</td>
</tr>
<tr>
<td>Control vars</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Note: Pension HH indicates whether a household member receives the pension after becoming eligible due to the reform.*
Robustness Check 1

Table 7: 2SLS Estimation of the Effect of the Social Pension on Child Outcomes with Alternative Sample

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Alternative cohort definition</th>
<th>HH with oldest member 50-70</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12-17</td>
<td>12-19</td>
</tr>
<tr>
<td>School enrollment</td>
<td>0.191** (0.082)</td>
<td>0.144** (0.070)</td>
</tr>
<tr>
<td>Child work</td>
<td>-0.234*** (0.083)</td>
<td>-0.186*** (0.072)</td>
</tr>
<tr>
<td>Observations</td>
<td>1584</td>
<td>2041</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level. All models control for individual and household characteristics as well as for year dummies and the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69, 70-79, 80-89 and 90+. Each cell reports estimates of Pension HH in separate regressions, where Pension HH indicates whether a household member receives the pension after becoming eligible due to the reform.
### Robustness Check 2

#### Table 8: Placebo analyses: Schooling and child work

<table>
<thead>
<tr>
<th></th>
<th>Enrollment 6-18</th>
<th>Enrollment 6-11</th>
<th>Enrollment 12-18</th>
<th>Work status 6-18</th>
<th>Work status 6-11</th>
<th>Work status 12-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension HH</td>
<td>-0.022*</td>
<td>-0.017</td>
<td>-0.008</td>
<td>0.066*</td>
<td>0.047*</td>
<td>0.112*</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.073)</td>
<td>(0.098)</td>
<td>(0.055)</td>
<td>(0.026)</td>
<td>(0.107)</td>
</tr>
<tr>
<td>Girl</td>
<td>0.016</td>
<td>-0.009</td>
<td>0.039</td>
<td>-0.017</td>
<td>-0.007</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.022)</td>
<td>(0.040)</td>
<td>(0.017)</td>
<td>(0.007)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Age</td>
<td>0.310***</td>
<td>0.529***</td>
<td>0.280***</td>
<td>-0.124***</td>
<td>0.005*</td>
<td>-0.279***</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.108)</td>
<td>(0.085)</td>
<td>(0.015)</td>
<td>(0.008)</td>
<td>(0.090)</td>
</tr>
<tr>
<td>Age²</td>
<td>-0.014***</td>
<td>-0.025***</td>
<td>-0.012***</td>
<td>0.007***</td>
<td>-0.000</td>
<td>0.012***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.006)</td>
<td>(0.003)</td>
<td>(0.001)</td>
<td>(0.000)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Total HH income</td>
<td>0.035***</td>
<td>0.005</td>
<td>0.054***</td>
<td>-0.014</td>
<td>0.004</td>
<td>-0.025</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.012)</td>
<td>(0.020)</td>
<td>(0.011)</td>
<td>(0.004)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Land area in 2007</td>
<td>-0.001</td>
<td>-0.001</td>
<td>-0.001</td>
<td>-0.001</td>
<td>-0.000</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.004)</td>
<td>(0.002)</td>
<td>(0.000)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Education of HH head</td>
<td>0.003</td>
<td>0.004</td>
<td>0.005</td>
<td>-0.002</td>
<td>-0.001</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.006)</td>
<td>(0.003)</td>
<td>(0.001)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>F-statistic 1st stage</td>
<td>93.8</td>
<td>58.7</td>
<td>71.8</td>
<td>92.0</td>
<td>59.2</td>
<td>71.0</td>
</tr>
<tr>
<td>R²</td>
<td>0.343</td>
<td>0.358</td>
<td>0.376</td>
<td>0.333</td>
<td>-0.005</td>
<td>0.311</td>
</tr>
<tr>
<td>Observations</td>
<td>2085</td>
<td>1000</td>
<td>1085</td>
<td>2098</td>
<td>1020</td>
<td>1078</td>
</tr>
</tbody>
</table>

*Pension HH* indicates whether a household member receives the pension after becoming eligible due to the 'Placebo' reform in 2008.
Robustness Check 3

Table 9: Placebo analyses: Expenditure items

<table>
<thead>
<tr>
<th></th>
<th>Total (Log)</th>
<th>Educ. (Log)</th>
<th>Educ. (Share)</th>
<th>Food (Log)</th>
<th>Food (Share)</th>
<th>Non food (Log)</th>
<th>Non food (Share)</th>
<th>Health (Log)</th>
<th>Health (Share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension HH</td>
<td>-0.032</td>
<td>0.201</td>
<td>0.015</td>
<td>-0.113</td>
<td>-0.035</td>
<td>-0.033</td>
<td>0.010</td>
<td>1.145**</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>(0.130)</td>
<td>(0.576)</td>
<td>(0.019)</td>
<td>(0.136)</td>
<td>(0.038)</td>
<td>(0.184)</td>
<td>(0.039)</td>
<td>(0.571)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>HH income</td>
<td>0.344***</td>
<td>0.345***</td>
<td>-0.001</td>
<td>0.243***</td>
<td>-0.037***</td>
<td>0.430***</td>
<td>0.404***</td>
<td>0.043</td>
<td>-0.005***</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.117)</td>
<td>(0.003)</td>
<td>(0.025)</td>
<td>(0.006)</td>
<td>(0.036)</td>
<td>(0.006)</td>
<td>(0.099)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Land area 2007</td>
<td>0.012*</td>
<td>0.011</td>
<td>0.000</td>
<td>0.012**</td>
<td>-0.000</td>
<td>0.014</td>
<td>0.000</td>
<td>0.024</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.023)</td>
<td>(0.001)</td>
<td>(0.006)</td>
<td>(0.001)</td>
<td>(0.010)</td>
<td>(0.001)</td>
<td>(0.022)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Educ. of HH head</td>
<td>0.036***</td>
<td>0.056*</td>
<td>0.002</td>
<td>0.019***</td>
<td>-0.006***</td>
<td>0.045***</td>
<td>0.004**</td>
<td>0.069**</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.031)</td>
<td>(0.001)</td>
<td>(0.007)</td>
<td>(0.002)</td>
<td>(0.010)</td>
<td>(0.002)</td>
<td>(0.032)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>F-stat 1st stage</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
<td>75.2</td>
</tr>
<tr>
<td>R²</td>
<td>0.324</td>
<td>0.233</td>
<td>0.123</td>
<td>0.195</td>
<td>0.105</td>
<td>0.267</td>
<td>0.093</td>
<td>0.028</td>
<td>0.034</td>
</tr>
<tr>
<td>Obs</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
<td>1,282</td>
</tr>
<tr>
<td>Control vars</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Pension HH* indicates whether a household member receives the pension after becoming eligible due to the 'Placebo' reform in 2008.
Conclusion & Policy Discussion

- Social pension raises school enrollment of older children in Thailand and reduces child work
- Increase in schooling (reduction of work) particularly due to male (female) pensioners
- Households with pensioners (esp. male) invest more money in the education of their children

Policy discussion

- Given effects on children schooling and work and fiscal constraints, should Thai government move back to targeted programme?
- If yes, what would be the 'New' criteria for poor elderly?

Any Suggestions are more than welcome

Thank you