PUEY UNGPHAKORN INSTITUTE
FOR ECONOMIC RESEARCH

The Impact of Cash Transfers on Child Outcomes in Rural Thailand: Evidence from a Social Pension Reform

by

Tabea Herrmann, Attakrit Leckcivilize, Juliane Zenker

December 2017

Discussion Paper

No. 77

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

Tabea Herrmann† Attakrit Leckcivilize‡ Juliane Zenker§

Abstract

Previous studies have identified a causal relationship between pension eligibility for the elderly and an improvement in education-related outcomes of co-residing children. In contrast to the often generous schemes considered before, this study investigates the effects of a non-contributory pension scheme in Thailand that grants much smaller benefits. Our empirical analysis exploits a reform which expanded the scheme from a targeted program to universal coverage. Using a generalized difference-in-difference model, we provide evidence that gaining eligibility for the scheme can affect work status and literacy of children living with eligible pensioners, while not actually raising total net household income. The effect sizes we find for older children in our sample are within the range of those estimated from more generous schemes. Younger children do not benefit from the reform.

JEL No.: J14, J24, D13, H55

Keywords: Cash transfer, Non-contributory pension scheme, School enrollment, Literacy

*__Acknowledgements.__ This research was funded by the German Research Foundation (DFG) in its FOR 756 and RTG 1723. The authors thank the editor, two anonymous referees and participants of the RTG 1723 Workshop and the European Association of Labour Economists Conference 2017 for valuable comments and suggestions.

†University of Hannover, RTG 1723 "Globalization and Development", Koenigsworther Platz 1, 30167 Hannover, Germany

‡University of Aberdeen, Health Economics Research Unit, Polwarth Building Foresterhill, Aberdeen AB25 2ZD, UK. Corresponding Author e-mail: attakrit.leckcivilize@abdn.ac.uk

§University of Goettingen, Department of Economic Sciences, Platz der Goettinger Sieben 5, 37073 Goettingen, Germany

1 Introduction

Intensive reforming over the last decades resulted in major progress toward universal primary and lower secondary enrollment in Thailand. Yet, several consecutive PISA studies alarmingly find that a third of the Thai students are functionally illiterate at the age of 15 (Lathapipat, 2013, 2018). The problem tends to be larger in the poorer rural areas, where students have less access to educational resources and qualified teachers are difficult to recruit (Lounkaew, 2013). Moreover, children in poor households face additional constraints to education: they may have to divide their focus between school and work tasks, i.e. have to spend part of their time to assist in family owned (farm-)businesses or otherwise contribute to the household income (Nicaise et al., 2000, Lathapipat, 2013). An increasing literature on conditional and unconditional cash transfers shows that cash influx can help to relief such constraints to education (Kabeer et al., 2012). In particular, various indirect benefits on schooling and work status have been perceived for children in pension-eligible households in South Africa, Brazil and Mexico (Edmonds, 2006, Ponczek, 2011, Carvalho Filho, 2012, Gutierrez et al., 2017).

In this study, we investigate the effects of a two-staged reform of the Thai social pension on child outcomes in Northeast Thailand. The first stage of the reform (in 2009) transformed an existing targeted pension scheme into a scheme with universal coverage. The reform introduced a monthly payment of 500 Baht ($\sim$ \$US 15) - equal to two to three days of median daily minimum wage - for all elderly aged 60 and above. The second stage of the reform (in 2011) increased the basic amount from 500 to 600 Baht ($\sim$ \$US 18) at entry age 60 and up to 1000 Baht ($\sim$ \$US 30) based on beneficiary age. As very poor households were eligible for pension payments also before the reform and not all eligible households registered for pension, the factual increase in average household pension income in our sample ranges from approximately 230 Baht per month (after the first reform) to approximately 460 Baht per month (after the second reform).

We conduct a generalized difference-in-difference analysis investigating the effects of the reform on school enrollment, children's work status, and literacy. In contrast to most previous studies, we use panel data in our analyses, which enables us to control for household-level unobserved heterogeneity. Specifically, we compare the within-changes of education-related outcomes for children in eligible households before and after the reform to the within-changes of a control group of children in similar but non-eligible households. As we find that pension payments do not significantly increase net total household income, we focus on interpreting the effects of pension eligibility instead of the level of transfers received. However, to account for possible selection issues due to non-universal pension take-up, we additionally implement an instrumental variable

strategy, i.e. we use pension eligibility to instrument for pension receipt, as validated in Duflo (2003). In all specifications, we restrict our sample to three-generation households. Thus, we ensure that children in the control group live with at least one member who (soon) qualifies for pension. Our treatment group also includes children living with elderly eligible for pension payments before the 2009 reform. We cannot distinguish these children from those living in post-reform eligible households because pre-reform eligibility criteria are too imprecise to identify them. Provided that the effects of pension on children in pre-reform eligible households have already occurred before 2009, the effect sizes we estimate could be regarded as conservative.

Our main findings are three-fold. First, we do *not* find conclusive statistically significant evidence that pension eligibility positively affects enrolment of children or adolescents at the aggregated level and when dis-aggregating the estimates by age, gender of child, and gender of pension recipient. However, for certain groups of children this may reflect a lack of statistical power and not a lack of economic relevance. There is some indication that the pension reform might have contributed positively to the probability of enrollment among the older cohort, particularly for boys. ITT-estimates for older boys range from (statistically insignificant) 6 to 12 percentage point increases in enrollment (from a baseline enrollment rate of 77 percent), depending on the gender of the pension recipient, and seem generally larger than those of girls ranging from -7 to 8 percentage points (insignificant; baseline enrollment rate of 85 percent). However, we also find relatively large (yet, insignificant) negative coefficients for the younger cohort, particularly for boys (ranging from -9 to -12 percentage points), suggesting a reallocation of resources within the household. In a robustness test we look at an alternative outcome for educational attainment – whether the household head indicates that a child's *main* occupation is student. While the effect estimates obtained from the ITT-specification are close to zero for the younger cohort and positive but statically insignificant for the older cohort, the LATE estimates indicate a significant (at the 10% level) increase in student status as main occupation for the older cohort.

Second, looking at children's work status, we examine whether children were less distracted from school as a result of the pension. We find a statistically significant 8 percentage point decrease in the likelihood to work for older children (baseline rate: 17 percent), while the younger cohort is not significantly affected (due to low incidents of work at baseline). The effect on older children seems particularly driven by a reduction in informal (agricultural) work for girls and reduced engagement in formal non-agricultural work for boys.

Finally, we examine whether these changes in time use translate into improved learning

outcomes. We find that some girls in the older cohort have benefited from pension with respect to literacy, measured as a binary variable reported by the household-head. Depending on recipient gender, estimates range from a 4 to a 7 percentage point increase (only the latter significant at the 10% level).[1] We do not detect such effects for older boys.

It is not clear, per se, that reducing labor supply (to increase education outcomes) of older teenagers is a worthy goal if the overall aim is to maximize/stabilize future income streams at the household or individual level. This would require that schooling decisions are distorted, for instance, by market failure (e.g. credit constraints) in absence of the pension. Although we cannot conclusively test for such distortions in our sample, existing studies indicate that educational attainment might be sub-optimal in the region. Nicaise et al. (2000) provide qualitative evidence that financial restrictions to education might play a role in poorer areas of Thailand. Karaivanov (2012) finds that the region is generally credit constraint and more so than the rest of the country. Tangtipongkul (2015) documents that private and social returns-to-education in Thailand peek at the Bachelor level – an attainment level which almost none of the children in our sample reach. Wongmonta and Glewwe (2017) show that returns to education are not only high in urban but also (albeit somewhat lower) in rural areas of Thailand. Furthermore, there is little doubt that additional rudimentary skills such as literacy should improve labor market prospects and, consequently, future income streams. We therefore conclude that the additional learning that pension brings is beneficial for (at least some of) the children in our sample, and perhaps the elderly in their households - if children pass on their educational returns when becoming adults.

Pension has the potential to change education outcomes through at least two channels. First, the positive income shock can ease credit constraints to education for the household as a whole or for individual household members (Edmonds, 2006, Ponczek, 2011).[2] While households in Northeast Thailand are generally poor, pension payments before 2009 were restricted to few very poor elderly only.[3] Newly eligible beneficiaries in our study area

[1] Due to measurement errors in the literacy variable at baseline (discussed below) we cannot provide meaningful baseline values for literacy rates here.

[2] Edmonds (2006) finds evidence that pension increases schooling for boys in households with eligible men. To explain his results, Edmonds (2006) argues that men in the study households might have been more credit constrained than women and that pension relieved these financial constraints enabling men to afford the costs to send a preferred child (i.e. a boy) to school. That pension can lead to financial reallocation within a household has also been shown in the remittance context (e.g. Jensen, 2004, Maitra and Ray, 2003, Fan, 2010, Juarez, 2009). Further, pension has been shown to ease financial constraints in the context of migration (e.g. Posel et al., 2006, Ardington et al., 2009, Galiani et al., 2016, Téllez-Rojo et al., 2013).

[3] As a result of the targeted policy before the reform, households with pension recipients prior to the reform were poorer compared to all other households. In other words, it seems that targeting of

are, hence, mostly poor but not extremely so. It is, therefore, reasonable to assume that their most basic needs were already met before the reform, which allows them to spend their pension income in goods or services not directly related to bare survival. Given that in the Thai context, children (especially girls) are expected to (financially) look after parents and grandparents in old age (Wongmonta and Glewwe, 2017), it is a reasonable hypothesis that older household members have an incentive to invest in their grandchildren's education, provided the return on additional training pays off. However, we demonstrate that pension income does not translate into greater spending on education at the household level overall. Coefficients are close to zero and insignificant. Yet, across all of our findings, we detect suggestive evidence of age-differentiated patterns of how pension affects child outcomes. The patterns we find are consistent with the interpretation that a reallocation of resources from the younger to older children in pension households might be at play. If pension eligibility induced a sudden awareness of aging, such a reallocation would be plausible as older children are closer to reach labor market maturity to harvest educational returns. Our study lacks statistical power to fully explore these patterns, though. Moreover, our expenditure data are only at the household level, prohibiting us to explore any intra-household reallocation of resources clearly. We therefore leave the research of this mechanism open to future studies.

Second, pension eligibility can facilitate changes in labor allocation. Studies show that pension allows elderly household members to retire earlier from their main occupation (e.g. discussed by Carvalho Filho, 2008, Kaushal, 2014, Juárez and Pfutze, 2015, Galiani et al., 2016). Yokying and Floro (2020) document that the labor supply of Thai children is positively correlated to the work activities of adults in the household. For instance, children help with tasks in the family business or (girls) take over household chores to enable adult household members to work. Consequentially, retirement decisions of elderly might decrease the likelihood of child work. However, binary labor supply responses of the eligible are statistically and economically insignificant in our sample. Yet, we provide evidence that total household income does not rise as a result of pension eligibility, while we document that pension payments were indeed received. This suggests that eligible elderly use pension payments to replace previous sources of income. We cannot exclude that a reduction of elderly labor supply happens along the intensive margin.

Our findings add to the literature in two distinct ways. First, our findings show that already relatively small pension payments might have a relatively large impacts on child outcomes (it remains questionable whether these effects are beneficial to all children, though, as discussed above). Compared to other pension programs studied in developing

poor elderly was successful (on average). Particularly, median annual per capita income of households receiving pension in 2008 was 784 US$ PPP compared to 1021 US$ PPP for all other households.

countries the Thai pension benefits are rather small (PPP$ 20-40, based on 2009 PPP conversion rate). The factual average additional pension income received by the average household we study corresponds (only) to roughly 60 to 70 percent of the average monthly education expenses per enrolled child spent by the households in our sample. Yet, the effect sizes we detect fall within a similar range compared to previous studies on more generous programs: For example, the intensely studied South African social pension system guarantees benefits that correspond to up to about half of the average South African household income (Case and Deaton, 1998). The maximum benefit amounts to 370 Rand (or $\sim$ PPP$ 135 as of 1993) per eligible[4]. Edmonds (2006) investigates the effects of the scheme and finds schooling rates increased by 12 (teenage boys) to 14 (teenage girls) percentage points and a reduction in work status for girls of 7 percentage points in both-gender eligible households. Further, a social pension in Brazil grants generous benefits equal to the size of monthly minimum wage: average benefits received in rural areas in 1991 were 121 Brazilian Real (or $\sim$ PPP$ 144 as of the 1995 PPP conversion rate)[5]. Ponczek (2011) and Carvalho Filho (2012) analyze the impact of the scheme and show that school attendance of girls increases if they live with beneficiaries of the reform, ranging from 2 (for every $R100 in Carvalho Filho (2012)) to 7 percentage points[6]. Ponczek (2011) further investigates literacy and finds that co-residing with male eligible improves girls' literacy by 7 percentage points. Finally, a pension scheme in Mexico City guarantees transfers of $US 60 which correspond to about 30 % of average income of eligible individuals[7]. Gutierrez et al. (2017) studies the effect of eligibility for the scheme on enrollment rates and work status in a regression discontinuity set-up. Their graphical analysis suggests an increase in enrollment and decrease in work status of teenagers by roughly 10 percentage points, respectively, at the pension-cut-off. The coefficients we compute in the present study fall into a similar range compared to previous studies, despite that the Thai pension payments are substantially lower. More generally, our study confirms that the size of the pension payment is not necessarily indicative of the size of the effect on child outcomes. This has been shown before by Li and Mora (2016) who estimate that a pension scheme in Nepal resulted in increased infant survival

[4]Studies investigating the pension in South Africa include Ardington et al. (2009), Bertrand et al. (2003), Case and Deaton (1998), Duflo (2003), Edmonds et al. (2005), Edmonds (2006), Hamoudi and Thomas (2014), Jensen (2004), Maitra and Ray (2003), Posel et al. (2006).

[5]However, the factual difference of pension income pre- and post-reform might have been smaller. The reform expanded coverage to more than one person per household, while lowering the minimum qualifying age and scaling up benefits to the level of minimum wage. Studies from Brazil include Carvalho Filho (2008, 2012), Ponczek (2011).

[6]To be precise, both authors draw on the same household data, but Ponczek (2011) uses two additional survey waves.

[7]For additional information on the Mexican pension schemes, see also Juarez (2009) and Juárez and Pfutze (2015).

of 7-8 percentage points from a baseline of 89%. The pension payment received was only 100 Nepal Rupees (or $\sim$ PPP$ 7.5 as of 1994) per month.

Second, and from a broader perspective, our study speaks to the literature that examines gender norms and disparities in the treatment of children in developing countries. Girls in Thailand are generally more expected than boys to (financially) care for their parents and grandparents in old age. In contrast to many other developing countries where an imbalance in educational investments typically leans towards preferring boys over girls, in Thailand girls are supported in their education just as much as boys (or even more). However, adverse social norms surrounding labor supply and compensation of female work strongly persist in Thailand. Despite better educational outcomes for girls (Lounkaew, 2013), women in Thailand earn less, participate less in the labor force and are more involved in unpaid work (Adireksombat et al., 2015, Fang and Sakellariou, 2011, Tangtipongkul, 2015, Thailand National Statistical Office, 2011). Within this nexus, a reduction in informal agricultural work of adolescent girls may be seen as a value in itself. Sociologists argue that the formation of gender norms is particularly intensified during adolescence (Hill and Lynch, 1983). Reducing the participation of teenage girls in informal (and likely unpaid) work may contribute to forming more balanced gender norms around the labor market and reinforce more gender-balanced labor market outcomes later in their lives.

The remainder of this paper is structured as follows. In Section 2, we give a brief overview of the history and characteristics of the social pension scheme in Thailand. We describe our data and empirical strategy in Section 3 and Section 4 respectively. Results are presented in Section 5.2 with additional robustness analyses in Section 6. Concluding remarks are in Section 7.

2 The universal pension scheme

In 2009, the Government of Thailand initiated a policy reform which made public pension available to all elderly in the country. The universal pension scheme replaced a means-tested system that was designed to provide financial assistance to the poorest among the elder population only. The old system fell short on adequately targeting the poorest elderly as coverage was perceived to be insufficient and unfair (Jitsuchon et al., 2012). Moreover, many "relatively less poor" and vulnerable elderly stood empty handed.

Since the implementation of the universal pension scheme in October 2009, any Thai aged 60 or older is eligible for the program – except for those who live in a public retirement

home or receive any other government pension (e.g. former civil servants) [8]. The system is non-contributory, yet registration is required in order to receive transfers. The size of benefits was initially set to 500 Baht ($\sim$ \$US 15) which was equivalent to approximately two or three median daily minimum wages. In October 2011, the level of benefits was further increased and set to vary by age of recipient. The minimum monthly payment was raised to 600 Baht ($\sim$ \$US 18) for individuals aged 60 to 69 and transfers for individuals aged 70 to 79, 80 to 89, and 90 or above were set to 700 Baht ($\sim$ \$US 21), 800 Baht ($\sim$ \$US 24), and 1000 Baht ($\sim$ \$US 30), respectively.

Figure 1 depicts the trend in the number of beneficiaries and corresponding government expenditure before and after the reform. In 2008, the final year before the reform, approximately 1.8 million elderly were registered under the targeted system. By 2010, the first post-reform year, the number had jumped to about 5.7 million beneficiaries. Due to administrative problems, coverage of the pension scheme was still incomplete, with approximately 70 % of the eligible population having registered (Jitsuchon et al., 2012). However, by 2013 most elderly qualifying for the program were reported to receive transfers which corresponds to a further rise in the number of pension recipients to about 7.3 million.

3 Data

We use data from the Thailand and Vietnam Socio-Economic Panel (TVSEP) collected in 2008, 2010 and 2013.[9] Data is collected at the household level and representative for the rural population of three provinces in the Northeast of Thailand. In 2008 the data set covers 2,136 households. Our data set includes child-level information on education and work status, as well as detailed household-level information, e.g. on income, expenditures, and social security transfers received.

Sample. We restrict our analyses to children aged 6 to 18 in 2008 who lived in households with three generations. Thereby, our sample covers all children who were of official primary or secondary school age in 2008[10]. We use data on 1,220 children of age 6-18 in 2008, or 748 three-generation households.

[8] These restrictions, however, do not influence our analyses since the elderly in the sample usually live alone or with their families. Moreover, the share of households with elderly receiving any other kind of government pension is below 1 % in our sample.

[9] For detailed information on the survey and the sampling procedure in particular, see Hardeweg et al. (2013). We use data till 2013 since the pension reform might not have taken its full effect by 2010. Most importantly, the time span from October 2009 when the universal pension system was first in place to April 2010 when data collection started is rather short. Implementation problems seem to be less severe in the region studied since approximately 85 % of eligible elderly were covered already in 2010.

[10] Officially, children in Thailand should attend primary school at ages 6 to 11 and secondary school

Main outcomes. To test the effect of pension receipt on schooling, we use a binary variable which equals one for children who reported to be enrolled in school or any institution of higher education, and zero otherwise. To measure child work, we construct another binary variable based on information given about children's (main or second) occupation. It equals one if children are reported to perform any full- or part-time work, and zero otherwise[11]. Literacy is measured as binary variable, based on the household head's reply to the question whether a child can read and write.

Table 1 presents the trend of school enrollment and child work before and after the reform. Overall enrollment is decreasing over time as children drop out of school. However, the drop-out rate seems to be somewhat weaker for children in beneficiary households as well as for girls. In contrast, work status is increasing over time, and the proportion of the increase appears to be slightly less strong for children in the treatment group and for girls.

We show descriptive statistics and pre-reform differences in individual and household characteristics for the children and elderly samples in Table 2. Child characteristics are reasonably balanced with only a few exceptions with respect to household composition. Naturally, the characteristics between eligible and not-yet eligible elderly are less balanced. The eligible group is on average 4 years older, more likely to be women, less likely to work, and lives in households with an older age-structure. To account for these age-related differences we include household fixed effects and a number of individual and household characteristics in our models, as described in section 4.

4 Methodology

To explore the effcts of teh pension reform on child outcomes, we use one pre-reform and two post-reform data waves and employ a generalized difference-in-differences model. Specifically, we use pension eligibility as explanatory variable in a standard OLS regression and augment it with two-way (household and time) fixed effects. We adopt this strategy from Bertrand et al. (2004) and Hansen (2007) who popularized it for identifying treatment effects in settings where exogenous policy changes affect multiple groups in different time periods. Moreover, we follow a standard practice in the literature that

at ages 12 to 17 (UNICEF, 2013). However, late enrollment is very common, especially in the region studied, and most children enter primary school at age 7 only.

[11]We define children to be working if they are reported to be engaged in own agriculture or related activities (e.g. fishing), to run a (family-owned) business, to be engaged in any (casual or permanent) off-farm agriculture or non-agriculture, to be a housewife or to serve in the army. Since housewives in our sample are typically married, the decision to work might be very different in that particular case. However, whether we include housewives to our definition of work does not change our results.

investigates effects of pension on child outcomes, (see e.g. Duflo, 2003), and restrict our sample to households with three generations, i.e. grand parents, parents and children.[12] We employ the following regression specification:

$$y_{iht} = \alpha_h + \theta_t + \beta PenElig_{ht} + \mathbf{X'_{iht}}\boldsymbol{\gamma} + e_{iht} \tag{1}$$

where y_{iht} is the outcome of interest for child i in household h at time t, and α_h and θ_t are household and year fixed effects, respectively. $PenElig_{ht}$ is a dummy for pension eligibility which is equal to one for households h accommodating at least one member who is 60 or older in 2010 or 2013, respectively, and zero otherwise[13]. X_{iht} is a vector of child and household characteristics. The child characteristics are age, age-squared, and gender, while the household characteristics are household income, years of schooling of the household head, and head counts of household members by gender-age groups. For the latter, we separately count male and female household members in groups of different ages as follows: 0-4, 5-9, ... , 55-59, 60-64 to 65-69, 70-79, 80-89, and 90 years or up. The error terms are represented by e_{iht}. Under standard assumptions (Wooldridge, 2005), our model can uncover average (partial) treatment effects, while allowing for heterogeneous in these effects. The coefficient of interest is β, which provides an estimate of the effect of pension eligibility – or intention-to-treat (ITT) estimate – on the outcomes of interest.[14]

To circumvent endogeneity concerns, we further use pension eligibility as an instrumental variable for the actual pension receipt.[15] We employ a Two-Stage Least Squares specification with household fixed effects to uncover estimates for Local Average Treatment Effects (LATE) (Imbens and Angrist, 1994). The second stage of this model can be specified as:

$$y_{iht} = \alpha_h^S + \theta_t^S + \beta^S Pension_{ht} + \mathbf{X'_{iht}}\boldsymbol{\gamma^S} + e_{iht}^S \tag{2}$$

[12] A few households in the sample have only grand parents and children.

[13] In alternative specifications we have also included dummies to account for possible additional effects of the increase in the amount of pension payments for certain age-groups due to the 2011 reform. Yet, these dummies were typically statistically and economically insignificant and coefficients on $PenElig_{ht}$ remained qualitatively similar. We, therefore, do not distinguish the results reported below by stage of the reform. However, these results are available upon request.

[14] As some eligible elders might not claim and receive their pension (less than 100% compliance), β is not the average contemporaneous effect estimated from the standard two-way fixed effects model (Imai and Kim, 2019).

[15] For example, there might be some time-varying unobserved characteristics of the household and it members that simultaneously affect both schooling or work decisions for children in the household and public pension receiving status. Grandparents who actively claim for their pension could be more highly motivated, less prone to procrastination, have better networking skills, or have higher cognitive capacity than those who did not contact authorities to get their pension. Moreover, according to Ponczek (2011), there is a possibility of misreporting the pension status.

with the following first stage:

$$Pension_{st} = \alpha_h^F + \theta_t^F + \beta^F PenElig_{ht} + \mathbf{X'_{iht}}\boldsymbol{\gamma^F} + e_{iht}^F \tag{3}$$

Here, $Pension_{ht}$ is equal to one if child i stayed in a household h reporting to receive public pension in period t, while all other variables are defined as in Equation 1.

Furthermore, the impact of the social pension could be diverse between gender of children and pensioners in the household due to differential preference of grandmothers and grandfathers towards girls and boys or unequal bargaining power among pensioners within the same household (Ponczek, 2011). Hence, we add gender-specific pension variables to the model in Equation 1: $PenEligF$ an $PenEligMF$ indicate if a household hosts eligible female or both eligible female and male household members, respectively.[16] The regression coefficients attached to $PenEligF$ and $PenEligMF$ represent estimates for the differential effects of the reform on children's outcomes when gender of pension eligible(s) is not male.

Standard errors of all specifications are clustered at the village level. These clustered standard errors allow for autocorrelation within the same village, which could absorb any common supply side factors such as school availability in the locality.

5 Results

5.1 Income effects

In a first set of results, we investigate the effect of pension eligibility on reported pension income and overall household income. Table 3 (column 1, 2, 4 and 5) documents that having a pension-eligible household member significantly increased a household's (logged) *pension* income. This increase is corroborated by Figure 2, which shows a local polynomial smooth plot of household pension income by age of oldest household member. The plot shows an expected steep increase of pension income around the pension entry age of 60, where the level of pension income reached expectedly differs by year and age. However, pension eligibility did not increase (logged) *total* household income in a relevant way, as evidenced by Table 3 (column 3 and 6) and Figure 3. This suggests that some substitution of income took place, perhaps due to a reduction in labor supply or crowding-

[16] Similarly, we can generate $PensionF$ and $PensionMF$ for the LATE estimation and use $PenEligF$ and $PenEligMF$ as instrumental variables.

out of other income sources, e.g. private transfers.[17] The remainder of this section will, therefore, analyse the pure effect of becoming eligible for pension instead of a combined effect of pension eligibility with an increase in household cash income (as effectively done in previous studies). We include total household income as a control variable in all specifications.

5.2 Age-disaggregated effects on child outcomes

Tables 4, 5, and 6 present the effects of social pension on child outcomes. All three tables present ITT estimates (Equation 1) in columns (1) to (3) and LATE estimates (Equations 2 and 3) in columns (4) to (6). In each panel, we report estimates for the full sample of children aged 6-18 in 2008, and for the younger (6-11 in 2008) and older cohorts (12-18 in 2008), respectively.

Results in the left panel can be interpreted as intention to treat estimates, as some individuals who are eligible have not taken up pension. Results in the right panel can be interpreted as a local average treatment effects (Imbens and Angrist, 1994) – i.e. effects on those who were eligible for the pension after the reform and actually enrolled and received the pension (compliers). The LATE estimates might differ from the average treatment effect depending on the nature of the compliers.

School enrollment: When looking at the sample that combines younger and older children in Tables 4 (columns 1 and 4), pension appears to have no effect on school enrollment. The coefficient is positive but close to zero and insignificant. This null effect is not a result of universal enrollment at baseline. Baseline enrollment levels of both, the younger (80 percent) and the older cohort (81 percent), leave room for improvement. Moreover, in Thailand, children are obliged to be in school till the age of 15 or until they have finished ninth grade. Many of the children in our sample are younger than 15 throughout the study period. Surprisingly, we find a negative but insignificant relationship between pension and school enrollment when restricting our sample to younger children in columns (2) and (5). In contrast, the estimates for older children in columns (3) and (6) suggest a positive relationship of pension eligibility and enrollment – yet, also not statistically significant. However, the (statistically insignificant) effect size of a 6 percentage points increase in enrollment for the older cohort in column (3) is comparable to the 5-10 percentage points found in early studies (e.g. Ponczek, 2011).

[17] Jensen (2004) and Juarez (2009) document that pension payments crowded out private transfers from family members in South Africa and Mexico, respectively.

While we see little statistically significant evidence that pension improves schooling along the extensive margin (enrollment), it may have affected education at the intensive margin. We investigate two proxies for education intensity below: children's work status and household-head reported literacy of a child.

Work status: Due to financial tension, children might decide to (or be pressured by the family to) engage in either part-time or full-time work to support their households.[18] Work responsibilities may distract children from studying and therefore affect learning outcomes. In Table 5 we report effects of the pension reform on child work. Pension eligibility and receipt are associated with a significant reduction in child work for all children and especially older children. Overall, the incidence of children's work status is reduced by 6.6 (22.7) percentage points in households that were eligible for (received) pension after the reform, based on the ITT (LATE) estimates. The effect is mainly driven by a reduction of the labor supply of older children, i.e. a reduction of 8.3 (27.5) percentage points or 48 percent (based on ITT estimates) given a baseline likelihood of older children of 17 percent. We discussed earlier that enrollment rates do not significantly improve as a result of the reform. However, children from the older cohort may have stopped engaging in part-time jobs parallel to going to school improving their focus on learning. In contrast, younger children experience no significant change in their work status as a result of the reform. However, the potential for improvement in the younger cohort was very low – having a job was very uncommon (less than 1 percent) for these children even before the reform.

The LATE estimates reported in Table 5 are generally much larger than the ITT estimates, which deserves some discussion with respect to the strength of our instrument. The F-statistics of the first-stage regressions are well above the critical value suggested by Stock and Yogo (2005), see the bottom panel of Table 5. However, the overlap between reform-induced new pension-eligibility and new pension receipt is relatively low. Roughly 915 out of 1220 children in our sample live in pension-eligible households in 2010. Yet, in 2010 only 25 percent of these children stay in households that factually began to receive pension payments due to the reform. This is due to two reasons. First, only 80 percent of the 915 children from eligible households live with elderly who received pension payments at all.[19] Second, more than half of the children who live in recipient households in 2010

[18]Given very low unemployment rate in Thailand (0.5-2.5%) throughout the periods of study, we believe that the numbers of youth leaving school and being unemployed are negligible.

[19]A lack of awareness of the program might be responsible. The new pension scheme was introduced in April 2009 and the reference period taken into account here is May 2009 till April 2010. However, we observe similar eligible-registration rates for 2013, which suggests that other reasons are at play. Some eligible non-takers may not economically depend on the pension and fear stigmatization; for others

have stayed with pension recipients already before the reform, i.e their households have qualified for the old (targeted) pension scheme. These "compliance" rates look similar for the 2013 data wave. We conclude that the inflated LATE effects are likely a mechanical consequence of low "compliance" and, therefore, focus on interpreting the ITT estimates.[20]

Literacy: We further assess whether the reduction in children's work status translates into better learning outcomes – measured as household-head reported reading and writing proficiency of the respective child. Table 6 shows that the pension reform has no significant effect on literacy rates in the overall sample and disaggregated by age cohort. While these results could be perceived as a lacking scope for improvement judged by the close-to universal literacy rates in 2008 and 2010, such a conclusion might be misleading. As documented in Table 1, literacy rates are reported to be much lower in the 2013 wave. The discrepancy across waves likely reflects a raise in awareness for the issue among household survey respondents due to the public discussion around the 2012 PISA study. The PISA-test results revealed a third of the Thai 15-year-olds to be functionally illiterate (Lathapipat, 2018). Household heads may not have been fully aware of the literacy-skills of co-residing children before the public discussion took place. Instead, respondents may have reported literacy levels based on the optimistic believe that a child who had spent some years in school should be able to read and write. It is likely, that at least some of the respondents in our sample verified their assumptions on co-residing children's literacy skills after the public literacy debate in 2012, resulting in overall lower reported literacy rates in the 2013 survey wave.

5.3 Gender-disaggregated effects on child outcomes

We further investigate the heterogeneous effects of pension by gender of the pensioners and the children in the household. Differential effects across gender may indicate different preferences or bargaining power within the household, as suggested for example by Ponczek (2011). We split our sample into boys and girls and include gender-specific dummy variables to the generalized difference-in-difference model indicating if male or female member(s) of the household are eligible for the pension, as described in Section 4. Judged by a very low F-statistic from a Wald-rk test by Kleibergen-Paap, the first stage of the Two-Stage Least Square model is too weak in the gender-disaggregated analysis to

transaction costs of registration might be too high.

[20] In a basic (quasi-)experimental set-up with a binary assignment indicator and a binary indicator for actual treatment receipt, LATE effects are equal to dividing ITT-effects by the compliance rate.

allow for a credible interpretation of the LATE estimates. Therefore, we restrict these tables to the ITT estimates. However, for completeness we document the LATE estimates in Appendix C.

Results for school enrollment, work status, and literacy are given in Tables 7, 8, and 9, respectively. We report the results for boys in odd and the results for girls in even columns. In each table, the upper panel reports the effect of pension in households with male eligible in the first row and the differences to female eligible or both-gender eligible households in the subsequent rows. The lower panel gives the computed effect sizes for male, female, and both-gender eligible households, each in a separate row, respectively.

Prior to describing the findings of this analysis, a cautionary note is required. The disaggregated results reported below origin from an analysis that is under-powered to draw generalized conclusions at conventional statistical significance levels. Therefore, as a general rule, all patterns we observe and describe from the results of this exercises should be understood as suggestive evidence only. We, nevertheless, report these disaggregated results, to correspond to the previous literature in this field of research, which generally reports the effects of pension disaggregated by gender of children and recipients. In our data, as evidenced by the results reported above, child age appears to be an important moderator for the effect of pension on education outcomes. We, therefore, continue to disaggregate our analysis by child age.

School enrollment: As evidenced by Table 7 (columns 1 and 2, lower panel), pension status has no statistically significant effect on school enrollment of boys or girls overall. Yet, we see suggestive differential patterns emerging when we additionally disaggregate by child age (columns 3 to 6, lower panel). While most coefficients for the younger cohort sample show negative (yet, insignificant) effects for both gender, this pattern is reversed for the older cohort. Moreover, generally coefficients appear to be larger (in absolute terms) for boys than for girls. As a suggestive evidence, there is some indication that the pension reform might have contributed positively to the probability of enrollment among boys in the older cohort, particularly those living with an eligible male pensioner. Coefficients range from 6% to 12% depending on the gender of the recipient and seem generally larger than those of girls ranging from -7% to 8%. Enrollment rates of older girls (85%) were generally higher before the reform compared to older boys (77%), i.e. girls dropped out of school at later ages. Hence, pension beneficiaries supporting older boys may reflect an effort to help boys to catch up with girls in schooling. However, the precision of all estimates is too low to draw any clear generalized conclusion. Also the coefficients indicating differences across households with different recipient-genders (upper panel) are all statistically insignificant.

Work status: Table 8 reports the disaggregated effects of the reform on work status. With few exceptions, most coefficients are negative suggesting that pension might have reduced child work. Again, the power in this disaggregated analysis is not sufficient for most of these coefficients to be estimated precisely. However, a few results stand out. Older girls appear to be slightly more affected by residing in a pensioner's household than boys (column 5 and 6, lower panel). In the older cohort, effect sizes for girls range from -5 to -13 percentage points (only the latter is significant at the 10% level). This is a reduction of 37 to 91 percent compared to older girls' likelihood to work at baseline (14 percent). The effect sizes for older boys range from nearly zero to a reduction of 8 percentage points (all insignificant). Moreover, younger boys might be somewhat more likely to be affected by the pension (range: -6 to -9 percentage points; insignificant) than younger girls (range: 1 to -6 percentage points; insignificant). Perhaps due to low statistical power, again the difference coefficients in the upper panel of the table are all insignificant. Therefore we cannot draw credible conclusions whether effect sizes are altered by recipient gender.

Literacy: Table 9 shows disaggregated effects of the reform on children's literacy. Overall, we cannot reject the null hypothesis that the reform is ineffective in improving literacy – with one exception. The reading skills of older girls increase with the reform: effects range from 5 to 7 percentage points (column 6, lower panel). The latter denotes the effect for older girls being in a household with both male and female eligible and it is significant at the 10% level.[21] In light of the earlier finding that older girls reduce their engagement in work activities, these literacy effects suggest that girls may have been able to focus more on studying (instead of work) as a result of living with pensioners, which has translated into better literacy skills. The literacy of older boys seems to be largely unaffected by the reform, with combined effects ranging from -1 to 1 percentage points. We observe a similar pattern for younger girls (range: -1 to 4; insignificant), while younger boys' literacy might be negatively affected: coefficients range from -3 to -10 percentage points (all insignificant).

5.4 Transmission channels

5.4.1 Education expenditure.

We examine whether the reform increases household education expenditure. In Table 10, we apply the Generalized Difference-in-Difference and Two-Stage Least Squared models

[21] Relating these effect sizes to baseline values is not feasible due to concerns of measurement error discussed in Section 5.2

(as desribed in Section 4) to the household-level data. Results in columns (1)-(2) and (7)-(8) do not indicate any significant impact on the natural logarithm of education expenditure or the share of education expenditure of total household expenditure. Overall, households with new pension eligible(s)/recipient(s) do not seem to invest more of their money in the education of co-residing children. This finding corroborates the zero effects found for school enrollment reported for the overall sample. We find no evidence that the reform affects education expenditure differently by gender of eligible.

5.4.2 Reallocation of labor

In this section, we discuss the reallocation of labor between from children to elderly as a potential effect channels through which the reform might have affected child outcomes.

Children: To understand the mechanisms better through which the improvement in older girls' literacy operates, we disentangle children's work types in Table 11 for the older cohort of children. In the table, the dependent variables indicate whether a child has worked (full-time or part-time) in the agricultural or non-agricultural sector. We further divide these sectors into formal and informal work types, resulting in four categories overall. Representative types of work in these categories are: engaging in households own agriculture (*informal agriculture*); permanently employed in agriculture (*formal agriculture*); non-farm owned business or household chores (*informal non-agriculture*); and permanently employed in non-agriculture (*formal non-agriculture*).

Aligned with the results reported above, we observe a reduction of 6 to 12 percentage points (only the latter significant at 5% level) in informal agricultural work for girls (column 4, lower panel), and a similar sized coefficient in informal non-agricultural work (not significant). As a general pattern, older girls seem to move out of agricultural and informal activities (and possibly into formal non-agricultural activities) as judged by the patterns of coefficient signs associated to the respective work types. We conclude that the drop in overall work status of older girls found in Table 8 is mainly driven by a decrease in girls' supply of labor as (likely unpaid) family workers in the household owned farm or other informal work arrangements in close proximity to the household and neighbourhood. Table 11, column (5), also shows a decrease in formal non-agriculture work (at 10% significant level) for older boys who live with male pensioners. Provided that most formal jobs in the non-agricultural sector can be characterized as paid full-time employment, such a reduction might imply a potential increase in enrollment among older boys with male pensioners. However, as shown in Table 7, our estimate on enrollment

for older boys, while of moderate size, is not precise enough to distinguish such an effect from zero.

Elderly: In Table 12, we explore whether the reduction in child work correspond to a reduction in the same work type of the male or female eligible individuals. Our data set features information on pension receipt only at the household level, not the individual level. We therefore report only the ITT-results in Table 12. The results suggest that neither elder men nor elder women change their work status at the extensive margin across all work types due to the reform. Particularly, we do not find evidence that men increase their involvement in formal non-agriculture work, nor do women increase their involvement in farm work (informal agriculture) at the extensive margin. Hence, at the extensive margin, reallocation of work does not seem to play a role in explaining a reduction in child work or a rise in literacy among the pension households. As we do not have information on the devoted hours per type of work, tests on the intensive margin will remain open for investigation by future research.

6 Robustness Analyses

6.1 Attrition

Our main estimations are based on a balanced panel of three-generation households from which we dropped all observations that do not have complete information across three survey waves. We can rule out the concern for differential attrition based on migration decisions of older children from eligible households to take up tertiary education or job search, as we still observe education and work related outcomes for these children in our surveys. However, survey attrition could bias our results if pension households have a different probability to drop out from the survey entirely or have a different probability to have missing values in key variable(s). We therefore test for differential attrition by pension eligibility in Table A.1. The table shows estimates from a model similar to Equation 1 and with gender-specific pension variables but without controlling for household composition or children's and household's characteristics (as some or all of these are not fully observed for those outside our main sample). Particularly, instead of estimating the reform's effect on children's education-related outcomes, we use an indicator, $InPanel$, as dependent variable, which equals one if the child is observed in a particular survey wave and zero otherwise. The overall sample has 3,714 observations which is 314 more than, for example, in our main specifications shown in Table 4. Table A.1 shows that pension

eligibility after the reform does not significantly predict the chance of being observed in the household survey. This holds for all sub-samples regardless of children's gender or age. Hence, we can rule out concerns on potential attrition biases in our ITT estimates.

Moreover, we test for potential selection bias following Wooldridge (2019). Using the unbalanced panel (including all available observations), we run our model in Equation 1 adding an additional variable, $InPanel(t+1)$, indicating if child i still appears in the sample in the subsequent data period $t+1$ or not. As Table A.2 shows, the indicator is insignificant for all child-level regressions for the three main dependent variables. Hence, we cannot reject the null hypothesis that dropping out of the sample in a subsequent period does not affect outcomes in time t, after controlling for a standard set of explanatory variables. In other words, we find no evidence for a connection between a present shock and attrition in the future. [22]

6.2 Falsification tests

To test robustness of our main findings, we further, conduct several falsification tests. First, we run placebo analyses using only pre-reform data collected in 2007 and 2008. We replicate the specifications used to estimate the ITT and LATE above, but set a hypothetical reform date of 2008 instead of 2009.[23]. Results on child outcomes are presented in Table B.1. Again, we provide separate estimates by age-cohorts. Neither school enrollment, literacy, nor children's work status were affected by the hypothetical pension eligibility (or pension recipient for LATE) before the actual reform, and this holds for all ages. The coefficient of pension receipt in column (7)-(12) are all statistically insignificant with strong instruments (judged by all F-statistics > 29, as reported in the table).

Moreover, we perform a falsification test based on alternative outcomes (Pizer, 2016). We select three outcomes which should theoretically not be affected by the social pension reform, i.e. average years of schooling of all adults (aged 25 or older) in the household, average age of all adults in the household, and household size. If pension had a significant impact on these measures, it could only operate through differential changes in household composition (e.g. differences in changes in living arrangements, migration or death). In our analysis above we took such potential changes into account by controlling for the gender-age composition of the household. We count household members by gender within each age cohort in steps of five years and include the resulting variables in all of our

[22]The sample size of these regressions are much smaller than those in Table 4-6 because such regressions automatically drop observation in the last periods of all i due to an inclusion of $InPanel(t+1)$.

[23]We cannot identify eligible individuals in the placebo analyses because pre-reform qualification criteria were not very precise. Yet age is a reasonable approximation as demonstrated by the size of the first-stage F-statistics reported below.

regressions. In table B.2 we test whether this approach is sufficient to truly account for possible differential changes in the household composition due to pension. If our approach is sufficient, the three placebo outcomes we chose should not significantly change due to the reform conditional on controlling for the age-cohort count variables. Reassuringly, we find that these outcomes are indeed not significantly altered by pension eligibility after the reform in 2009.

6.3 Alternative sample definition

In this section we examine, whether the effects we find are sensitive to systematically restricting our sample by the age of the oldest household member. We reproduce the generalized difference-in-difference specification from above but reduce the sample based on the households' oldest members' age in consecutive steps. We present the results of this analysis in Figures 4 to 7. In each figure, we report the effect estimates (with 95% confidence intervals) of reducing the sample to households with an oldest member within a certain age-range around the pension-age cut-off 60. For instance, the first estimation point on the far left represents the estimated effect of pension on the particular outcome when reducing the sample to only those households that have an oldest member in the age range between 56 and 63. The next estimate to the right is based on including households with oldest members aged between 55 and 64, and so forth. The estimate on the far right of each panel is based on including households with oldest members of all ages.[24]

Generally speaking, the estimates to the left of each figure can be assumed to be less biased (as they are computed only including the most similar households in terms of oldest member's age), while the estimates to the right of each figure are based on a larger sample and are therefore estimated with greater precision. Instead of making the (non-trivial) choice of finding the optimal cut-off point that optimizes the trade-off between these two criteria (Lee and Lemieux, 2010), we choose to report the full range of estimates for maximized transparency.

Overall, the figures corroborate our earlier findings and endorse our choice to report the estimates based on households with oldest members of all ages in the main results section above. They indicate that using all households irrespective of oldest member's

[24]The oldest household member across all households in our data is 110 years old. The figures do not report estimates based on oldest members' age ranges of 57 to 62, 58 to 61, or 59 to 60 because the confidence intervals become very large in these cases for most estimates. Including these estimates in the graphs would have compromised the readability of the remaining results. Furthermore, starting from age range 49 to 70 the figures report estimates only in steps of five, as differences between estimates become negligible the larger the bandwidth. However, including these sets of left-out estimates in our graphical analysis does not qualitatively change the interpretation of the results.

age does not seem to severely bias the point estimates, whereas it helps to gain some more precision. The point estimates based on households with the full age-range are typically either very similar in size or lean towards zero compared to the point estimates from the analysis that restricts the sample to very similar households. The estimates reported in the main section of this paper can therefore be viewed as conservative, or as a lower-bound of the effectiveness of pension on child outcomes.

6.4 Alternative cohort definition

In this section we examine, whether the effects we find for the older cohort are sensitive to how we specify the age range of that cohort. We show that our findings are relatively robust to altering the age cut-off. Specifically, we re-run our analysis including children aged 12 to 17 or 12 to 19 in 2008, respectively. Results are presented in Table B.3 with each cell showing the estimate from a separate regression. We do see that the results vary slightly – the coefficients appear to become stronger in the slightly younger sample and weaker in the slightly older sample. This finding is consistent with the interpretation that the pension might be most effective for the younger members of this older cohort and that the effects fade out for adolescents who are already at the edge of adulthood in 2008.

6.5 Alternative outcome variables

In this section we demonstrate that our findings remain qualitatively unchanged when using alternative measures of schooling and child work available in our data. We run the above specifications on (1) a binary variable that indicates whether child i's occupation was reported as student by the household head (instead of the household-head reported information on whether a child is enrolled in school), and (2) a dummy variable for work status similar to the one used above, with the exception that it measures employment off the household and household owned farm only (i.e. we exclude domestic chores or works in the family farm or business). Table B.4 provides results for all children in our sample, and for the younger and older cohorts separately. Each cell presents the estimate from a separate regression of *Pension eligible / receipt* on the dependent variable listed in the first column. Neither the size nor the significance of coefficients changes much when using the alternative variables for schooling and child work. In fact, the effect of residing with a pension recipient on being a full-time student appears to be larger (and in the case of LATE significant at the 10% level) than the enrollment-based estimates reported above.

7 Conclusion

A reform of the social pension scheme in Thailand made public pension available to all elderly aged 60 and up. The expansion from a targeted scheme to universal coverage allows us to investigate the impact of an exogenous cash transfer to moderately poor elderly recipients on co-residing children.

Our estimates suggest that some children benefit from pension received by co-residing elderly. Yet, there are considerable differences with respect to gender and age of a child. We find a reduction of child work for older children in our sample. Boys are less likely to engaged in (paid) work when living with a male recipient and girls are less likely to work (particularly on the household farm), particularly when beneficiaries are female. These findings are consistent with differences in preferences or bargaining power of pension recipients, but other mechanisms may be at play. We also find improved literacy rates for older girls in both-gender pension-eligible households. When investigating the effects of the reform on school enrollment, our estimates are statistically insignificant. Yet, the estimated coefficients are of similar size compared to the effects found in previous studies. Throughout our results we perceive a pattern of coefficients related to positive changes for older children, while younger children appear unaffected or even worse off. However, our study is statistically under-powered to satisfactorily explore these patterns. We therefore have to leave further investigation along these lines for future research.

References

Adireksombat, K., Z. Fang, and C. Sakellariou (2015): "The evolution of gender wage differentials in Thailand: 1991-2007 – An application of unconditional quantile regression," *Singapore Economic Review*, 60.

Ardington, C., A. Case, and V. Hosegood (2009): "Labor supply responses to large social transfers: Longitudinal evidence from South Africa," *American economic journal: Applied economics*, 1, 22–48.

Bertrand, M., E. Duflo, and S. Mullainathan (2004): "How much should we trust differences-in-differences estimates?" *The Quarterly journal of economics*, 119, 249–275.

Bertrand, M., S. Mullainathan, and D. Miller (2003): "Public Policy and Extended Families: Evidence from Pensions in South Africa," *The World Bank Economic Review*, 17, 27–50.

Carvalho Filho, I. E. d. (2008): "Old-age benefits and retirement decisions of rural elderly in Brazil," *Journal of Development Economics*, 86, 129–146.

——— (2012): "Household income as a determinant of child labor and school enrollment in Brazil: Evidence from a social security reform," *Economic Development and Cultural Change*, 60, 399–435.

Case, A. and A. Deaton (1998): "Large cash transfers to the elderly in South Africa," *The Economic Journal*, 108, 1330–1361.

Duflo, E. (2003): "Grandmothers and granddaughters: old-age pensions and intrahousehold allocation in South Africa," *The World Bank Economic Review*, 17, 1–25.

Edmonds, E. V. (2006): "Child labor and schooling responses to anticipated income in South Africa," *Journal of Development Economics*, 81, 386–414.

Edmonds, E. V., K. Mammen, and D. L. Miller (2005): "Rearranging the family? Income support and elderly living arrangements in a low-income country," *Journal of Human resources*, 40, 186–207.

Fan, E. (2010): "Who benefits from public old age pensions? Evidence from a targeted program," *Economic Development and Cultural Change*, 58, 297–322.

Fang, Z. and C. Sakellariou (2011): "A Case of Sticky Floors: Gender Wage Differentials in Thailand," *Asian Economic Journal*, 25, 35–54.

Galiani, S., P. Gertler, and R. Bando (2016): "Non-contributory pensions," *Labour Economics*, 38, 47–58.

Gutierrez, E., L. Juarez, and A. Rubli (2017): "The effect of a transfer program for the elderly in Mexico City on co-residing children's school enrollment," *World Bank Economic Review*, 31, 809–828.

Hamoudi, A. and D. Thomas (2014): "Endogenous coresidence and program incidence: South Africa's Old Age Pension," *Journal of Development Economics*, 109, 30 – 37.

Hansen, C. B. (2007): "Generalized least squares inference in panel and multilevel models with serial correlation and fixed effects," *Journal of econometrics*, 140, 670–694.

Hardeweg, B., S. Klasen, and H. Waibel (2013): "Establishing a database for vulnerability assessment," *Vulnerability to Poverty - Theory, Measurement, and Determinants*, 50–79.

Hill, J. P. and M. E. Lynch (1983): "The intensification of gender-related role expectations during early adolescence," in *Girls at Puberty*, ed. by J. Brooks-Gunn and A. Peterson, 201–228.

Imai, K. and I. S. Kim (2019): "When should we use unit fixed effects regression models for causal inference with longitudinal data?" *American Journal of Political Science*, 63, 467–490.

Imbens, G. W. and J. D. Angrist (1994): "Identification and Estimation of Local Average Treatment Effects," *Econometrica*, 62, 467–475.

Jensen, R. T. (2004): "Do private transfers 'displace' the benefits of public transfers? Evidence from South Africa," *Journal of Public Economics*, 88, 89–112.

Jitsuchon, S., E. Skoufias, and M. Wiener (2012): "Reducing elderly poverty in Thailand: the role of Thailand's pension and social assistance programs," *World Bank*.

Juarez, L. (2009): "Crowding out of private support to the elderly: Evidence from a demogrant in Mexico," *Journal of Public Economics*, 93, 454–463.

Juárez, L. and T. Pfutze (2015): "The Effects of a Noncontributory Pension Program on Labor Force Participation: The Case of 70 y Más in Mexico," *Economic Development and Cultural Change*, 63, 685–713.

Kabeer, N., C. Piza, and L. Taylor (2012): "What are the economic impacts of conditional cash transfer programmes? A systematic review of the evidence." Tech. rep., Technical report. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Karaivanov, A. (2012): "Financial constraints and occupational choice in Thai villages," *Journal of Development Economics*, 97, 201–220.

Kaushal, N. (2014): "How public pension affects elderly labor supply and well-being: Evidence from India," *World Development*, 56, 214–225.

Lathapipat, D. (2013): "The influence of family wealth on the educational attainments of youths in Thailand," *Economics of Education Review*, 37, 240–257.

——— (2018): "Inequalities in Educational Attainment," in *Education in Thailand*, 345–372.

Lee, D. S. and T. Lemieux (2010): "Regression discontinuity designs in economics," *Journal of economic literature*, 48, 281–355.

Li, Y. and R. Mora (2016): "Re-assessing the Impact of the Grandparent's Income on the Infant Mortality Rate: An Evaluation of the Old Age Allowance Program in Nepal," *World Development*, 87, 333–348.

Lounkaew, K. (2013): "Explaining urban-rural differences in educational achievement in Thailand: Evidence from PISA literacy data," *Economics of Education Review*, 37, 213–225.

Maitra, P. and R. Ray (2003): "The effect of transfers on household expenditure patterns and poverty in South Africa," *Journal of Development Economics*, 71, 23–49.

Nicaise, I., P. Tonguthai, and I. Fripont (2000): *School dropout in Thailand: Causes and remedies*.

Pizer, S. D. (2016): "Falsification testing of instrumental variables methods for comparative effectiveness research," *Health services research*, 51, 790–811.

Ponczek, V. (2011): "Income and bargaining effects on education and health in Brazil," *Journal of Development Economics*, 94, 242–253.

Posel, D., J. A. Fairburn, and F. Lund (2006): "Labour migration and households: A reconsideration of the effects of the social pension on labour supply in South Africa," *Economic modelling*, 23, 836–853.

Stock, J. H. and M. Yogo (2005): "Testing for Weak Instruments in Linear IV Regression," *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg*, 80.

Tangtipongkul, K. (2015): "Rates of return to schooling in Thailand," *Asian Development Review*, 32, 38–64.

Téllez-Rojo, M. M., B. Manrique-Espinoza, K. Moreno-Tamayo, V. d. La Cruz-Góngora, G. Ángeles, and A. Salinas-Rodríguez (2013): "Heterogeneous impact of the non-contributory pension programme 70 y más on nutritional status of the elderly in rural Mexico," *The Lancet*, 381, S143.

Thailand National Statistical Office (2011): *Gender Equality and Women Empowerment 1990 - 2008*.

UNICEF (2013): "Monitoring the situation of children and women - Multiple Indicator Cluster Survey 2012," *UNICEF*.

Wongmonta, S. and P. Glewwe (2017): "An analysis of gender differences in household education expenditure: the case of Thailand," *Education Economics*, 25, 183–204.

Wooldridge, J. M. (2005): "Fixed-effects and related estimators for correlated random-coefficient and treatment-effect panel data models," *Review of Economics and Statistics*, 87, 385–390.

——— (2019): "Correlated random effects models with unbalanced panels," *Journal of Econometrics*, 211, 137–150.

Yokying, P. and M. S. Floro (2020): "Parents' labour force participation and children's involvement in work activities: Evidence from Thailand," *Oxford Development Studies*, forthcoming.

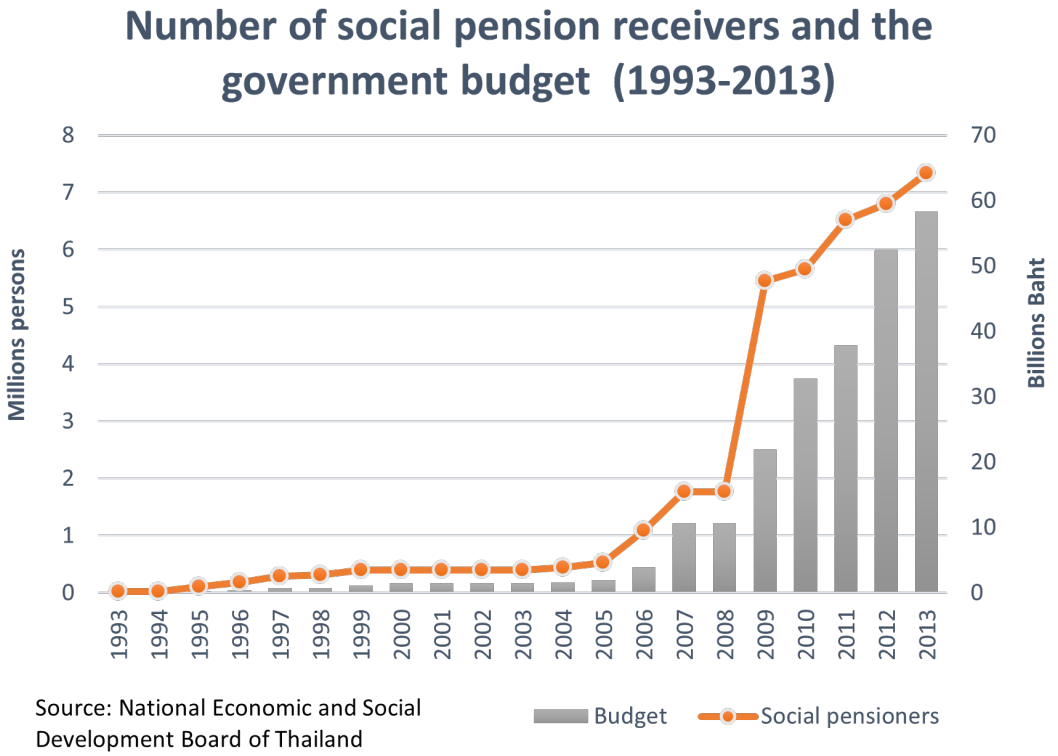

FIGURE 1: Number of beneficiaries of the social pension scheme and corresponding size of government budget in Thailand, 1993-2013 (Source: National Economic and Social Development Board of Thailand)

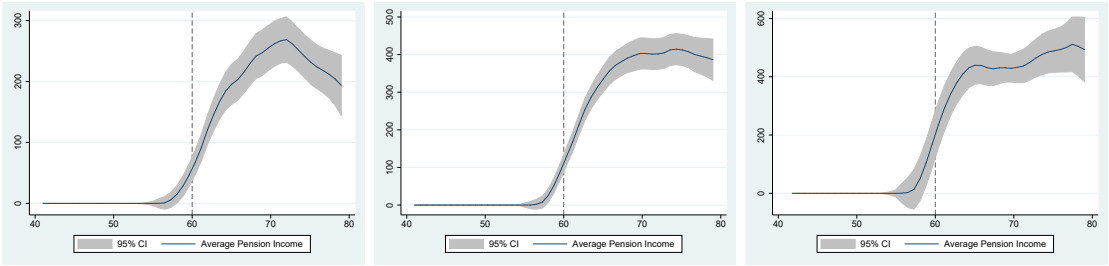

FIGURE 2: Household pension income by age of oldest household member (2008, 2010, and 2013)

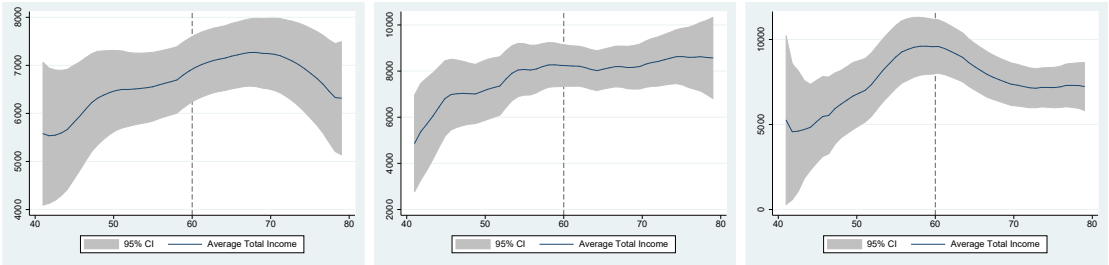

FIGURE 3: Household total income by age of oldest household member (2008, 2010, and 2013)

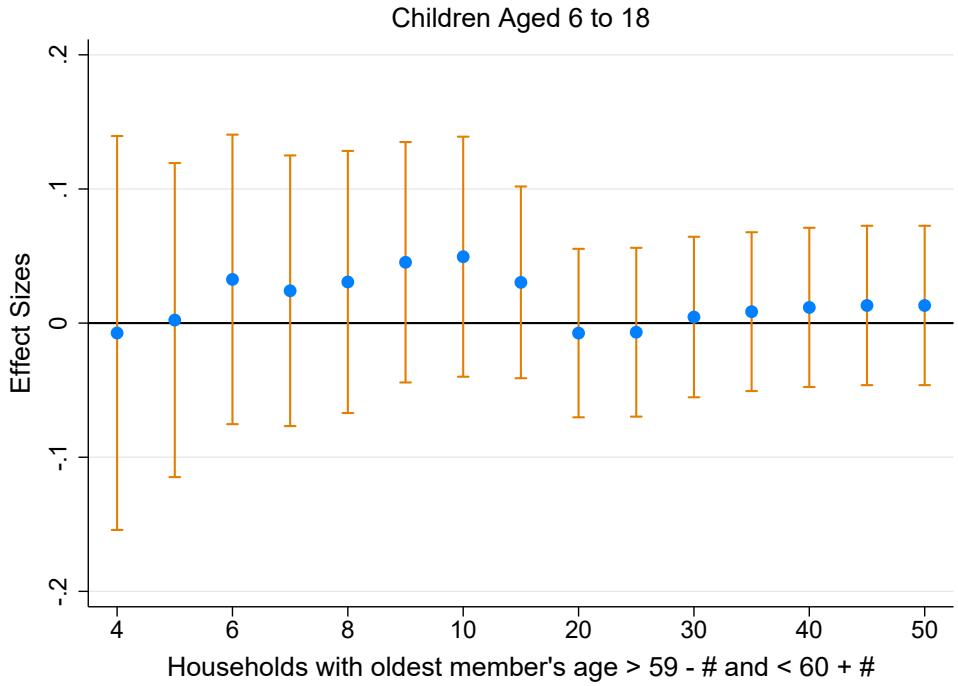

FIGURE 4: The effect of the social pension on school enrollment – by included households based on the oldest household member: ITT

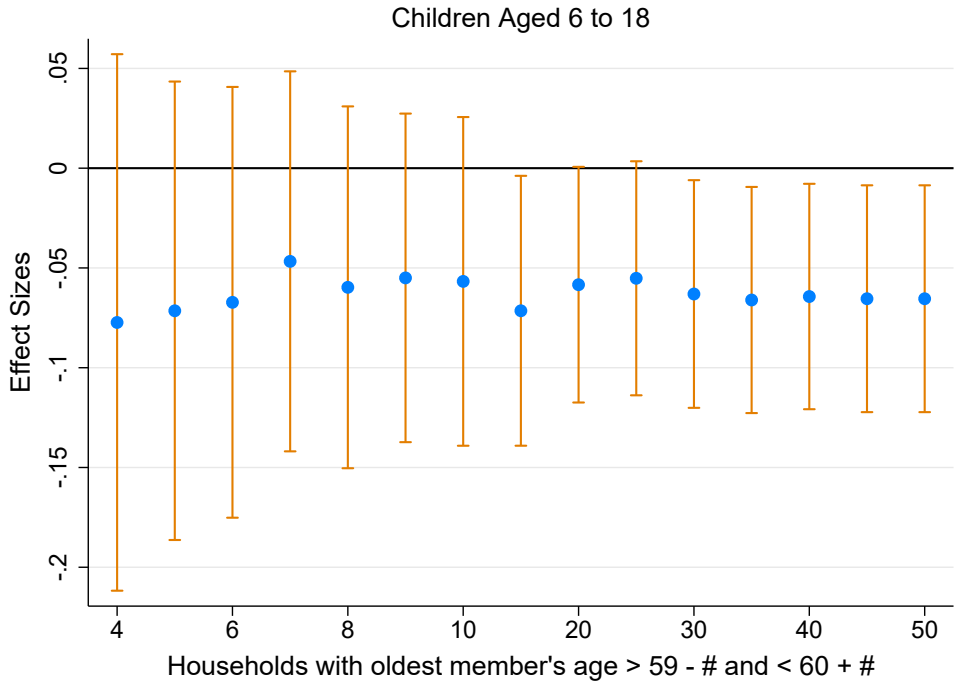

FIGURE 5: The effect of the social pension on child work – by included households based on the oldest household member: ITT

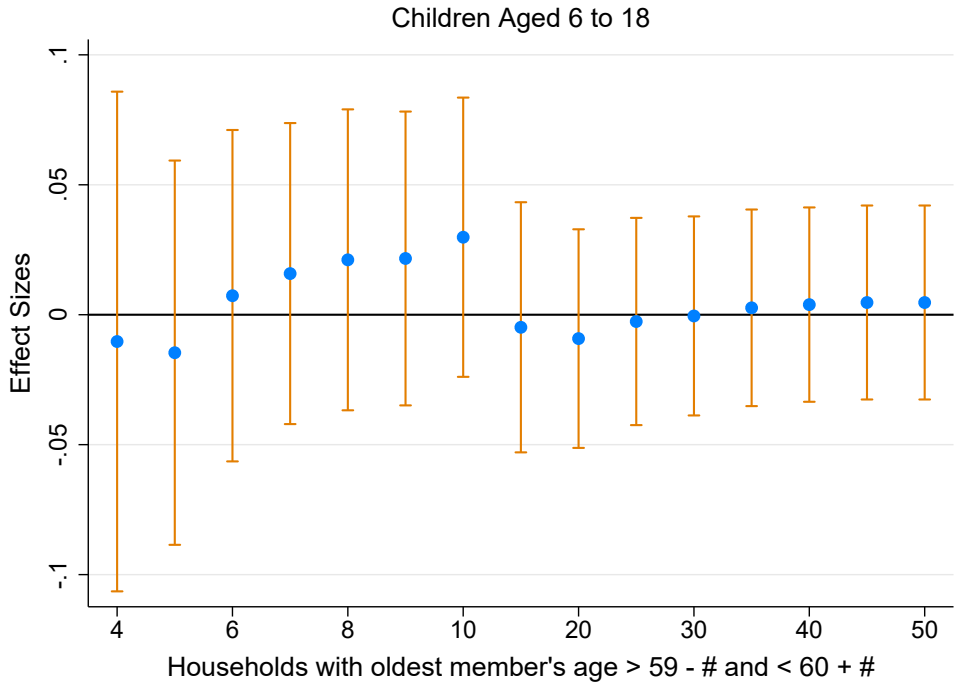

FIGURE 6: The effect of the social pension on literacy – by included households based on the oldest household member: ITT

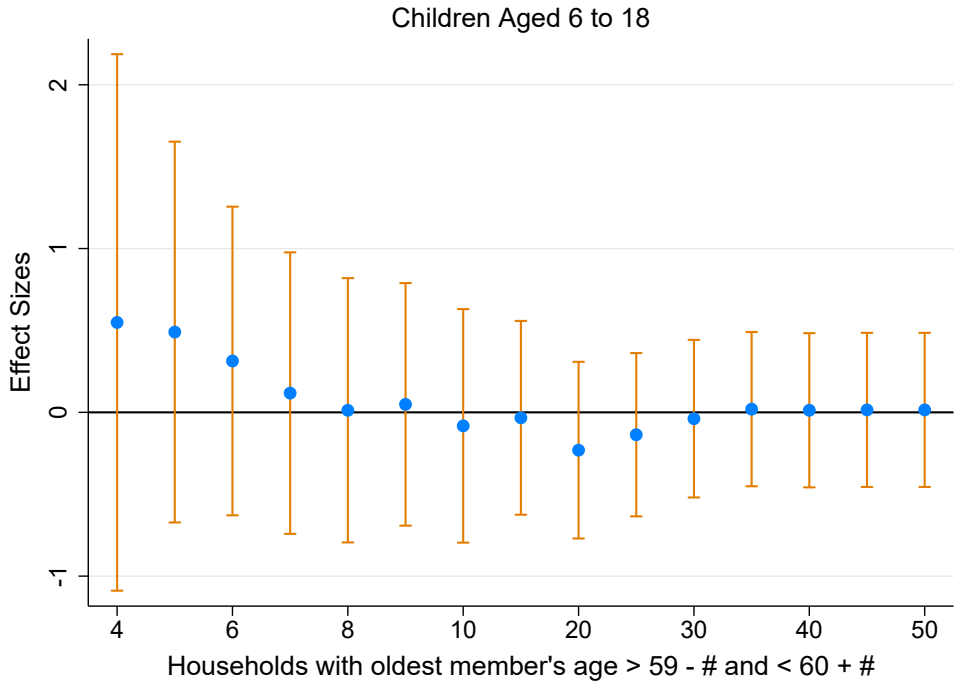

FIGURE 7: The effect of the social pension on log household annual education expenditure – by included households based on the oldest household member: ITT

Table 1: School enrollment, child work and literacy rate (percentage)

	Before reform	After reform		Difference (t-test)	
	2008	2010	2013	2008 vs. 2010	2008 vs. 2013
Panel A: Enrollment					
Children (Eligible HH)	81.6	82.3	64.2	0.7	-17.4***
Children (Non-eligible HH)	79.1	76.6	57.6	-2.5	-21.5***
Boys	78.8	76.0	58.1	-2.8	-20.6***
Girls	81.5	81.8	62.5	0.3	-19.0***
Panel B: Work status					
Children (Eligible HH)	9.2	13.5	28.4	4.3***	19.2***
Children (Non-eligible HH)	10.1	20.0	34.9	9.9***	24.8***
Boys	11.2	19.8	35.3	8.6***	24.1***
Girls	8.2	14.8	29.1	6.6***	20.9***
Panel C: Literacy					
Children (Eligible HH)	90.0	92.4	84.4	2.4*	-5.6***
Children (Non-eligible HH)	88.8	94.9	81.4	6.0**	-7.4**
Boys	89.5	92.3	85.0	2.8*	-4.4**
Girls	90.1	93.3	82.7	3.2**	-7.4***

Note: School enrollment, work status, and literacy of children aged 6 to 18 in 2008. ***, ** and * indicate significance at the 1%, 5% and 10% level respectively.

Table 2: Children and elderly characteristics in 2008 and balance tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Children						Elderly					
	Living in Control HH	Living in Eligible HH	Diff.	Boys	Girls	Diff.	Living in Control HH	Living in Eligible HH	Diff.	Men	Women	Diff.
Enrolled (Yes=1)	0.734	0.819	-0.085**	0.787	0.820	-0.032						
	(0.031)	(0.013)	(0.033)	(0.018)	(0.016)	(0.023)						
Literate (Yes=1)	0.888	0.903	-0.015	0.897	0.903	-0.006						
	(0.021)	(0.010)	(0.023)	(0.013)	(0.012)	(0.017)						
Enrolled and works (Yes=1)	0.014	0.025	-0.011	0.029	0.018	0.011						
	(0.010)	(0.005)	(0.012)	(0.007)	(0.006)	(0.009)						
Works (Yes=1)	0.140	0.088	0.052**	0.113	0.082	0.031*	0.880	0.777	0.103***	0.831	0.754	0.077***
	(0.024)	(0.009)	(0.025)	(0.013)	(0.011)	(0.017)	(0.034)	(0.015)	(0.037)	(0.017)	(0.017)	(0.020)
Works in informal agriculture (Yes=1)	0.051	0.029	0.022	0.041	0.026	0.015	0.704	0.592	0.112**	0.689	0.536	0.153***
	(0.015)	(0.006)	(0.016)	(0.008)	(0.007)	(0.011)	(0.049)	(0.018)	(0.052)	(0.022)	(0.020)	(0.023)
Works in formal agriculture (Yes=1)	0.005	0.000	0.005	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
	(0.005)	(0.000)	(0.005)	(0.002)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Works in informal non-agriculture (Yes=1)	0.089	0.053	0.036	0.069	0.050	0.019	0.407	0.269	0.139***	0.266	0.295	-0.029
	(0.021)	(0.007)	(0.022)	(0.011)	(0.009)	(0.014)	(0.050)	(0.016)	(0.052)	(0.020)	(0.018)	(0.023)
Works in formal non-agriculture (Yes=1)	0.005	0.009	-0.004	0.008	0.008	0.000	0.037	0.033	0.004	0.068	0.006	0.061***
	(0.005)	(0.003)	(0.006)	(0.004)	(0.004)	(0.005)	(0.018)	(0.006)	(0.019)	(0.011)	(0.003)	(0.012)
Age	12.051	11.799	0.253	11.853	11.834	0.019	55.722	64.852	-9.130***	63.715	64.126	-0.412
	(0.263)	(0.108)	(0.284)	(0.148)	(0.145)	(0.213)	(0.953)	(0.316)	(0.999)	(0.407)	(0.369)	(0.445)
Female	0.542	0.506	0.037	0.000	1.000	–	0.500	0.573	-0.073**	0.000	1.000	–
	(0.034)	(0.016)	(0.038)	(0.000)	(0.000)	–	(0.034)	(0.009)	(0.035)	(0.000)	(0.000)	–
# of male HH members, age 0-19	1.472	1.370	0.102	1.904	0.897	1.007***	1.185	1.158	0.027	1.195	1.135	0.060*
	(0.112)	(0.064)	(0.128)	(0.062)	(0.052)	(0.057)	(0.100)	(0.045)	(0.109)	(0.049)	(0.042)	(0.033)
# of male HH members, age 20-59	1.921	1.585	0.336***	1.650	1.638	0.013	2.074	1.595	0.479***	1.715	1.587	0.128***
	(0.106)	(0.055)	(0.119)	(0.059)	(0.058)	(0.063)	(0.143)	(0.049)	(0.151)	(0.055)	(0.046)	(0.037)
# of male HH members, age 60 and up	0.037	0.530	-0.492***	0.458	0.428	0.029	0.037	0.594	-0.557***	0.679	0.431	0.248***
	(0.019)	(0.026)	(0.032)	(0.028)	(0.026)	(0.029)	(0.022)	(0.023)	(0.032)	(0.025)	(0.022)	(0.019)
# of female HH members, age 0-19	1.505	1.341	0.163	0.853	1.863	-1.010***	1.185	1.140	0.046	1.148	1.141	0.007
	(0.121)	(0.050)	(0.131)	(0.048)	(0.051)	(0.063)	(0.098)	(0.039)	(0.106)	(0.042)	(0.038)	(0.030)
# of female HH members, age 20-59	2.164	1.864	0.300**	1.939	1.895	0.044	2.343	1.873	0.470***	1.962	1.887	0.075**
	(0.108)	(0.057)	(0.122)	(0.061)	(0.057)	(0.060)	(0.118)	(0.049)	(0.127)	(0.053)	(0.046)	(0.035)
# of female HH members, age 60 and up	0.084	0.649	-0.565***	0.542	0.556	-0.013	0.130	0.653	-0.523***	0.493	0.684	-0.191***
	(0.026)	(0.026)	(0.036)	(0.029)	(0.027)	(0.030)	(0.041)	(0.024)	(0.047)	(0.026)	(0.023)	(0.019)
HH income quintiles	3.112	3.152	-0.040	3.137	3.153	-0.016	3.250	3.188	0.062	3.292	3.120	0.172***
	(0.135)	(0.066)	(0.150)	(0.072)	(0.072)	(0.081)	(0.159)	(0.060)	(0.169)	(0.065)	(0.058)	(0.048)
Total land area	3.337	3.492	-0.155	3.477	3.453	0.024	3.619	3.638	-0.019	3.772	3.533	0.239
	(0.338)	(0.150)	(0.370)	(0.187)	(0.158)	(0.208)	(0.545)	(0.182)	(0.571)	(0.193)	(0.183)	(0.148)
Years of education of HH head	4.888	4.042	0.846***	4.105	4.274	-0.169	4.861	4.116	0.745**	4.256	4.139	0.116
	(0.226)	(0.100)	(0.247)	(0.118)	(0.106)	(0.127)	(0.300)	(0.095)	(0.313)	(0.105)	(0.095)	(0.083)
N			1213			1213			1090			1090

Notes: Columns *Diff.* report differences between eligible and control households, between boys and girls, and between elderly men and women, respectively. Differences and orthogonality tests were computed using the user-written Stata command *orth_out*. ***,**, * indicate statistical significance at the 1, 5 and 10% level.

Table 3: Effect of eligibility / pension receiving on household income

	ITT			LATE		
	Log Pension Income (1)	Share Pension Income (2)	Log Total Income (3)	Log Pension Income (4)	Share Pension Income (5)	Log Total Income (6)
Eligible HH	1.761***	0.015**	-0.059			
	(0.257)	(0.006)	(0.061)			
Pension HH				6.108***	0.050***	-0.206
				(0.125)	(0.014)	(0.170)
HH income (lagged)	-0.276**	-0.004*	-0.015	-0.020	-0.002	-0.024
	(0.131)	(0.002)	(0.028)	(0.016)	(0.002)	(0.025)
Education of HH head	-0.005	-0.001	0.011	0.007	-0.001	0.010
	(0.064)	(0.002)	(0.015)	(0.009)	(0.001)	(0.011)
F-statistic 1st stage	-	-	-	71.273	71.273	71.273
R^2	0.713	0.608	0.662	0.976	0.318	0.200
Observations	2121	2121	2121	2118	2118	2118
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether at least one household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether at least one household member receives the pension either before or after the reform.

Table 4: Effect of pension on school enrollment

	ITT			LATE		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	0.013	-0.050	0.058	-	-	-
	(0.030)	(0.044)	(0.045)			
Pension HH	-	-	-	0.045	-0.183	0.193
				(0.092)	(0.134)	(0.129)
Girl	0.054**	0.012	0.081*	0.054**	0.015	0.080**
	(0.027)	(0.036)	(0.047)	(0.023)	(0.030)	(0.040)
Age	0.201***	0.354***	-0.082*	0.201***	0.358***	-0.082**
	(0.016)	(0.076)	(0.047)	(0.015)	(0.064)	(0.040)
Age^2	-0.009***	-0.013***	-0.000	-0.009***	-0.013***	-0.000
	(0.001)	(0.004)	(0.001)	(0.001)	(0.003)	(0.001)
Total HH income	0.017	0.001	0.024	0.016	0.008	0.024*
	(0.012)	(0.014)	(0.015)	(0.011)	(0.013)	(0.013)
Education of HH head	-0.002	-0.001	0.001	-0.002	-0.002	0.001
	(0.008)	(0.007)	(0.013)	(0.007)	(0.006)	(0.011)
Enrollment rate 2008 (%)	80.38	79.79	80.89	80.38	79.79	80.89
F-statistic 1^{st} stage	-	-	-	54.061	32.68	45.302
R^2	0.571	0.555	0.661	0.333	0.271	0.334
Observations	3400	1573	1827	3393	1563	1821
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table 5: Effect of pension on child work

	ITT			LATE		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	-0.066**	-0.040	-0.083*	-	-	-
	(0.029)	(0.034)	(0.045)			
Pension HH	-	-	-	-0.227**	-0.145	-0.275**
				(0.097)	(0.111)	(0.137)
Girl	-0.059***	-0.013	-0.096**	-0.059***	-0.010	-0.095**
	(0.019)	(0.020)	(0.047)	(0.017)	(0.016)	(0.040)
Age	-0.081***	-0.032***	0.067	-0.079***	-0.028***	0.067*
	(0.011)	(0.012)	(0.046)	(0.010)	(0.010)	(0.040)
Age^2	0.005***	0.002***	0.001	0.005***	0.001***	0.001
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Total HH income	-0.018*	-0.017*	-0.011	-0.013	-0.012	-0.011
	(0.010)	(0.010)	(0.016)	(0.009)	(0.010)	(0.013)
Education of HH head	0.001	0.002	-0.003	0.001	0.001	-0.003
	(0.007)	(0.006)	(0.013)	(0.007)	(0.005)	(0.012)
Working 2008 (%)	9.73	0.89	17.41	9.73	0.89	17.41
F-statistic 1^{st} stage	-	-	-	54.061	32.68	45.302
R^2	0.578	0.381	0.615	0.280	0.018	0.262
Observations	3400	1573	1827	3393	1563	1821
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table 6: Effect of pension on literacy

	ITT			LATE		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	0.004	-0.023	0.023	-	-	-
	(0.019)	(0.037)	(0.019)			
Pension HH	-	-	-	0.012	-0.082	0.077
				(0.057)	(0.111)	(0.051)
Girl	-0.006	0.021	0.009	-0.006	0.022	0.009
	(0.017)	(0.041)	(0.021)	(0.015)	(0.034)	(0.018)
Age	0.131***	0.297***	-0.011	0.131***	0.299***	-0.011
	(0.012)	(0.060)	(0.018)	(0.011)	(0.050)	(0.016)
Age^2	-0.004***	-0.010***	0.000	-0.004***	-0.010***	0.000
	(0.000)	(0.003)	(0.001)	(0.000)	(0.003)	(0.000)
Total HH income	0.003	-0.011	0.012*	0.003	-0.008	0.012**
	(0.008)	(0.013)	(0.006)	(0.007)	(0.011)	(0.005)
Education of HH head	0.003	0.008	0.001	0.003	0.007	0.001
	(0.005)	(0.007)	(0.006)	(0.004)	(0.006)	(0.005)
Literacy rate 2008 (%)	90.02	79.09	99.54	90.02	79.09	99.54
F-statistic 1^{st} stage	-	-	-	54.061	32.68	45.302
R^2	0.448	0.616	0.456	0.189	0.315	0.077
Observations	3400	1573	1827	3393	1563	1821
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table 7: Effect of pension on school enrollment (ITT) – by gender

	6-18		6-11		12-18	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)
Pension Eligible	0.032	0.055	-0.091	0.035	0.122	0.084
	(0.065)	(0.057)	(0.076)	(0.081)	(0.093)	(0.082)
Δ Female Eligible	-0.013	-0.062	0.002	-0.090	-0.060	-0.065
	(0.067)	(0.057)	(0.065)	(0.089)	(0.097)	(0.075)
Δ Male + Female Eligible	0.031	-0.039	-0.035	0.013	0.046	-0.087
	(0.052)	(0.045)	(0.061)	(0.064)	(0.073)	(0.063)
Enrolment rate 2008 (%)	78.72	81.96	81.07	78.52	76.60	84.87
R^2	0.640	0.633	0.662	0.592	0.710	0.700
Observations	1670	1730	794	779	876	951
Control variables						
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible	0.019	-0.007	-0.089	-0.055	0.062	0.019
	(0.054)	(0.045)	(0.064)	(0.064)	(0.079)	(0.069)
Male Eligible	0.032	0.055	-0.091	0.035	0.122	0.084
	(0.065)	(0.057)	(0.076)	(0.081)	(0.093)	(0.082)
Male + Female Eligible	0.050	-0.047	-0.124	-0.042	0.108	-0.068
	(0.064)	(0.053)	(0.081)	(0.070)	(0.089)	(0.080)

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female) Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman).

Table 8: Effect of pension on child work (ITT) – by gender

	6-18		6-11		12-18	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)
Pension Eligible	-0.062	-0.051	-0.089	0.013	-0.041	-0.119
	(0.056)	(0.049)	(0.064)	(0.057)	(0.093)	(0.078)
Δ Female Eligible	-0.015	-0.037	0.033	-0.042	-0.043	-0.009
	(0.056)	(0.053)	(0.048)	(0.060)	(0.098)	(0.080)
Δ Male + Female Eligible	0.036	0.018	-0.022	-0.033	0.090	0.076
	(0.049)	(0.036)	(0.042)	(0.032)	(0.085)	(0.055)
Working 2008 (%)	11.32	8.21	0.36	1.41	21.15	13.95
R^2	0.635	0.625	0.437	0.429	0.647	0.669
Observations	1670	1730	794	779	876	951
Control variables						
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible	-0.078	-0.088**	-0.056	-0.028	-0.084	-0.127*
	(0.054)	(0.037)	(0.060)	(0.044)	(0.088)	(0.066)
Male Eligible	-0.062	-0.051	-0.089	0.013	-0.041	-0.119
	(0.056)	(0.049)	(0.064)	(0.057)	(0.093)	(0.078)
Male + Female Eligible	-0.042	-0.071*	-0.077	-0.061	0.006	-0.051
	(0.059)	(0.041)	(0.060)	(0.039)	(0.099)	(0.070)

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman).

Table 9: Effect of pension on literacy (ITT) – by gender

	6-18		6-11		12-18	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)
Pension Eligible	-0.006	0.042	-0.027	0.035	-0.004	0.043
	(0.040)	(0.035)	(0.073)	(0.066)	(0.016)	(0.035)
Δ Female Eligible	-0.025	-0.017	-0.068	-0.036	0.010	0.009
	(0.040)	(0.033)	(0.076)	(0.077)	(0.017)	(0.023)
Δ Male + Female Eligible	0.012	0.008	0.034	-0.004	-0.018	0.019
	(0.028)	(0.031)	(0.056)	(0.060)	(0.023)	(0.028)
Literacy rate 2008 (%)	89.70	90.34	78.57	79.58	99.68	99.41
R^2	0.556	0.519	0.705	0.635	0.582	0.565
Observations	1670	1730	794	779	876	951
Control variables						
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible	-0.031	0.025	-0.095	-0.001	0.006	0.052
	(0.032)	(0.032)	(0.063)	(0.055)	(0.015)	(0.037)
Male Eligible	-0.006	0.042	-0.027	0.035	-0.004	0.043
	(0.040)	(0.035)	(0.073)	(0.066)	(0.016)	(0.035)
Male + Female Eligible	-0.019	0.032	-0.061	-0.005	-0.012	0.071*
	(0.038)	(0.035)	(0.073)	(0.066)	(0.023)	(0.036)

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman).

Table 10: Effect of pension on education expenditure – overall and by gender of recipient

	ITT				LATE			
	Log (1)	Share (2)	Log (3)	Share (4)	Log (5)	Share (6)	Log (7)	Share (8)
Eligible/Pension HH	0.027	0.014			0.095	0.050		
	(0.238)	(0.011)			(0.653)	(0.031)		
Male Eligible/Recipient			0.162	0.020			0.548	0.067
			(0.334)	(0.015)			(1.048)	(0.048)
Δ Female Eligible/Recipient			-0.128	-0.008			-0.454	-0.022
			(0.347)	(0.015)			(1.099)	(0.049)
Δ Male + Female Eligible/Recipient			-0.382	0.001			-0.561	0.001
			(0.272)	(0.012)			(0.641)	(0.030)
HH income (lagged)	0.062	-0.001	0.066	-0.001	0.066	0.001	0.054	0.001
	(0.118)	(0.004)	(0.117)	(0.004)	(0.098)	(0.004)	(0.098)	(0.004)
Education of HH head	-0.002	0.001	-0.003	0.001	-0.002	0.001	0.012	0.001
	(0.066)	(0.003)	(0.065)	(0.003)	(0.052)	(0.002)	(0.054)	(0.002)
Education Expenditure (2008)	5.15	7.40%	5.15	7.40%	5.15	7.40%	5.15	7.40%
F-statistic 1st stage	-	-	-	-	71.273	71.273	9.097	9.097
R^2	0.611	0.514	0.612	0.514	0.142	0.060	0.148	0.055
Observations	2121	2121	2121	2121	2118	2118	2117	2117
Control variables								
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible/Recipient			0.035	0.012			0.089	0.045
			(0.266)	(0.012)			(0.733)	(0.034)
Male + Female Eligible/Recipient			-0.347	0.012			-0.475	0.046
			(0.321)	(0.015)			(0.691)	(0.033)

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

Note: The sample is limited to households with children aged 6 to 18 where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 20-24 ... 65-69,70-79, 80-89 and 90+ and binary variables indicating the presence of a child of age 5, 6 ... 18 and 19 separately for boys and girls. In the left panel (*Reduced form*), *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman). In the right panel (*LATE*), *Male (Female / Male + Female) Recipient* indicates whether a male (female / male and female) household member receives the pension after becoming eligible due to the reform. $\Delta Female(Male + Female)Recipient$ measures the additional effect if a woman (man and woman) receives the pension after becoming eligible due to the reform compared to a man (the individual effects of a man and a woman).

Table 11: Effects of pension on type of child work (ITT) – by gender; children aged 12-18

	Dependent Variable: Work Type:							
	Agriculture				Non-Agriculture			
	Formal		Informal		Formal		Informal	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)	Boys (7)	Girls (8)
Pension Eligible	0.007	-0.043	-0.012	-0.106	-0.087*	0.059	0.052	-0.071
	(0.028)	(0.027)	(0.071)	(0.071)	(0.048)	(0.063)	(0.100)	(0.070)
Δ Female Eligible	-0.007	0.025	-0.005	-0.015	0.081*	-0.001	-0.110	-0.023
	(0.022)	(0.016)	(0.077)	(0.060)	(0.042)	(0.051)	(0.097)	(0.073)
Δ Male + Female Eligible	-0.026	-0.003	0.017	0.066	-0.002	0.029	0.046	0.006
	(0.018)	(0.010)	(0.063)	(0.047)	(0.040)	(0.044)	(0.082)	(0.047)
Working 2008 (%)	0.32	0.00	7.69	4.75	1.60	1.19	12.82	8.31
R^2	0.399	0.338	0.486	0.573	0.484	0.473	0.508	0.515
Observations	869	936	869	936	869	936	869	936
Control variables								
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible	0.000	-0.017	-0.018	-0.121**	-0.006	0.057	-0.058	-0.094
	(0.023)	(0.016)	(0.069)	(0.056)	(0.047)	(0.052)	(0.093)	(0.064)
Male Eligible	0.007	-0.043	-0.012	-0.106	-0.087*	0.059	0.052	-0.071
	(0.028)	(0.027)	(0.071)	(0.071)	(0.048)	(0.063)	(0.100)	(0.070)
Male + Female Eligible	-0.026	-0.020	-0.000	-0.055	-0.008	0.087	-0.012	-0.088
	(0.033)	(0.022)	(0.074)	(0.066)	(0.056)	(0.062)	(0.104)	(0.071)

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In the top panel, $\Delta Female(Male+Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (reference category). In the bottom one, *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform.

Table 12: Effects of pension on recipients' employment status (ITT) – by gender; elderly from HH with child(ren) aged 12-18

	Dependent Variable: Work Type:			
	Agriculture		Non-Agriculture	
	Formal (1)	Informal (2)	Formal (3)	Informal (4)
Male Elder				
Pension Eligible	-0.014	0.042	0.019	0.032
	(0.019)	(0.065)	(0.032)	(0.094)
Working 2008 (%)	0.00	67.42	4.84	25.48
R^2	0.389	0.703	0.626	0.553
Observations	864	864	864	864
Female Elder				
Pension Eligible	-0.01	0.018	0.009	-0.058
	(0.013)	(0.065)	(0.023)	(0.075)
Working 2008 (%)	0.00	48.79	0.72	30.43
R^2	0.359	0.693	0.464	0.499
Observations	1174	1174	1174	1174
Year dummies	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

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

Note: The sample is limited to elderly living in households where at least one child aged 12 to 18 were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. *Male (Female) Eligible* indicates whether an individual is male (female) and was eligible to receive the pension due to the reform.

Appendices

A Attrition

Table A.1: Differential attrition

	Dependent Variable: In Panel (Yes=1; No=0)								
	6-18	6-11	12-18	6-18		6-11		12-18	
	Boys & Girls			Boys	Girls	Boys	Girls	Boys	Girls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pension Eligible	-0.005	-0.016	0.006	-0.049	0.002	-0.094	-0.031	-0.005	0.036
	(0.022)	(0.032)	(0.027)	(0.038)	(0.039)	(0.058)	(0.059)	(0.045)	(0.047)
Δ Female Eligible				0.023	0.033	0.054	0.090	-0.007	-0.016
				(0.044)	(0.036)	(0.066)	(0.058)	(0.047)	(0.042)
Δ Male + Female Eligible				-0.013	-0.008	-0.009	-0.050	-0.018	0.029
				(0.037)	(0.030)	(0.055)	(0.046)	(0.048)	(0.040)
R^2	0.390	0.433	0.426	0.433	0.409	0.476	0.435	0.451	0.441
Observations	3714	1725	1989	1821	1893	869	856	952	1037
Control variables									
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible				-0.025	0.035	-0.039	0.059	-0.012	0.020
				(0.033)	(0.034)	(0.043)	(0.051)	(0.044)	(0.044)
Male Eligible				-0.049	0.002	-0.094	-0.031	-0.005	0.036
				(0.038)	(0.039)	(0.058)	(0.059)	(0.045)	(0.047)
Male + Female Eligible				-0.039	0.027	-0.048	0.008	-0.031	0.049
				(0.033)	(0.035)	(0.045)	(0.054)	(0.046)	(0.046)

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

Note: Dependent variable indicates whether a child is observed or whether it has dropped out of the sample in period t (due to either missing of the whole household from the survey or missing value of key variable(s)). The sample is limited to children living in households where three or more generations were present in 2008. *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male+Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman).

Table A.2: Unbalanced panel selection

	Household FE with selection dummy into the next period								
	Enrollment			Work status			Literacy		
	6-18	6-11	12-18	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
In_Panel (t+1)	0.035	0.023	0.060	-0.022	-0.050	0.022	0.020	0.039	0.034
	(0.043)	(0.064)	(0.062)	(0.041)	(0.050)	(0.064)	(0.030)	(0.064)	(0.025)
Eligible HH	-0.012	-0.084	0.027	-0.028	-0.010	-0.038	-0.018	-0.052	0.006
	(0.039)	(0.060)	(0.058)	(0.032)	(0.030)	(0.057)	(0.024)	(0.057)	(0.010)
Girl	0.054*	0.025	0.096*	-0.049**	-0.008	-0.100*	-0.008	0.031	0.013
	(0.030)	(0.055)	(0.056)	(0.022)	(0.015)	(0.051)	(0.021)	(0.064)	(0.017)
Age	0.299***	0.319***	0.084	-0.108***	-0.029***	-0.096	0.191***	0.276***	-0.015
	(0.045)	(0.079)	(0.078)	(0.025)	(0.010)	(0.072)	(0.024)	(0.067)	(0.017)
Age^2	-0.013***	-0.011***	-0.006**	0.006***	0.002***	0.006***	-0.007***	-0.009**	0.000
	(0.002)	(0.004)	(0.002)	(0.001)	(0.000)	(0.002)	(0.001)	(0.003)	(0.001)
Total HH income	-0.006	0.005	-0.010	-0.004	-0.019	0.004	-0.002	-0.011	0.001
	(0.017)	(0.026)	(0.024)	(0.015)	(0.017)	(0.022)	(0.012)	(0.028)	(0.005)
Education of HH head	-0.004	0.003	-0.010	-0.002	-0.004	-0.005	0.011	0.019	-0.001
	(0.009)	(0.012)	(0.018)	(0.007)	(0.004)	(0.018)	(0.009)	(0.016)	(0.002)
R^2	0.613	0.670	0.725	0.607	0.492	0.683	0.588	0.709	0.683
Observations	2392	1109	1283	2392	1109	1283	2392	1109	1283
Control variables									
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. *In_Panel (t+1)* is a dummy equal to one if the child is included in the sample of the next period. They could be excluded in t+1 as a result of missing value of key variables or completely dropout from the survey.

Table B.1: Placebo analyses: School enrollment, child work and literacy

	ITT									LATE								
	Enrollment			Work status			Literacy			Enrollment			Work status			Literacy		
	6-18	6-11	12-18	6-18	6-11	12-18	6-18	6-11	12-18	6-18	6-11	12-18	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Eligible/	-0.001	-0.003	0.014	0.019	0.017	0.027	-0.003	0.019	-0.005	-0.005	-0.013	0.057	0.074	0.064	0.107	-0.011	0.069	-0.020
Pension HH	(0.030)	(0.045)	(0.044)	(0.029)	(0.022)	(0.056)	(0.024)	(0.051)	(0.012)	(0.096)	(0.127)	(0.137)	(0.091)	(0.061)	(0.174)	(0.076)	(0.138)	(0.038)
Girl	0.032	-0.019	0.095	-0.026	-0.013	-0.069	-0.003	-0.020	0.015	0.032	-0.019	0.095*	-0.026	-0.013	-0.068	-0.003	-0.020	0.015
	(0.032)	(0.048)	(0.074)	(0.025)	(0.017)	(0.064)	(0.018)	(0.053)	(0.021)	(0.026)	(0.035)	(0.057)	(0.020)	(0.012)	(0.049)	(0.015)	(0.039)	(0.016)
Age	0.274***	0.396***	0.194	-0.115***	-0.011	-0.172	0.182***	0.470***	0.024	0.274***	0.397***	0.188*	-0.116***	-0.015	-0.182	0.183***	0.466***	0.026
	(0.031)	(0.142)	(0.148)	(0.022)	(0.012)	(0.154)	(0.022)	(0.171)	(0.041)	(0.026)	(0.105)	(0.114)	(0.018)	(0.010)	(0.119)	(0.018)	(0.129)	(0.034)
Age^2	-0.012***	-0.019**	-0.009*	0.006***	0.001	0.008	-0.007***	-0.021**	-0.001	-0.012***	-0.019***	-0.009**	0.006***	0.001	0.008**	-0.007***	-0.021***	-0.001
	(0.001)	(0.008)	(0.005)	(0.001)	(0.001)	(0.005)	(0.001)	(0.009)	(0.001)	(0.001)	(0.006)	(0.004)	(0.001)	(0.001)	(0.004)	(0.001)	(0.007)	(0.001)
Total HH income	0.003	-0.011	0.004	0.008	0.005	0.013	0.009	0.015	0.004	0.003	-0.01	0.003	0.006	0.001	0.011	0.009	0.010	0.005
	(0.016)	(0.026)	(0.023)	(0.018)	(0.006)	(0.033)	(0.016)	(0.035)	(0.005)	(0.014)	(0.020)	(0.018)	(0.016)	(0.006)	(0.026)	(0.013)	(0.029)	(0.004)
Education of	0.004	-0.004	0.007	-0.002	0.001	-0.005	0.005	0.010	0.000	0.004	-0.005	0.008	-0.001	0.002	-0.003	0.005	0.010	0.000
HH head	(0.009)	(0.011)	(0.014)	(0.008)	(0.001)	(0.017)	(0.008)	(0.017)	(0.001)	(0.008)	(0.009)	(0.011)	(0.007)	(0.002)	(0.014)	(0.007)	(0.012)	(0.001)
F-stat 1st stage	-	-	-	-	-	-	-	-	-	42.63	29.506	29.162	44.457	32.00	29.467	45.113	33.056	29.162
R^2	0.653	0.714	0.774	0.644	0.499	0.727	0.618	0.708	0.467	0.252	0.302	0.259	0.234	0.032	0.172	0.222	0.315	0.016
Observations	2093	1002	1091	2106	1022	1084	2118	1027	1091	2078	978	1088	2102	1014	1081	2115	1020	1088
Control variables																		
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HH composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Note: The sample is limited to children living in households where three or more generations were present in 2007. Standard errors are clustered at the village level. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table B.2: Falsification (Outcomes at Household Level)

	Average years of education	Average age	HH size
Eligible HH	-0.086	0.163	0.030
	(0.100)	(0.139)	(0.155)
Year 2010	0.284***	0.899***	-0.231*
	(0.086)	(0.119)	(0.133)
Year 2013	0.685***	2.445***	-0.168
	(0.094)	(0.172)	(0.149)
Total HH income (lagged)	0.069	-0.064	-0.004
	(0.050)	(0.070)	(0.070)
Education of HH head	0.235***	-0.066	-0.005
	(0.040)	(0.060)	(0.030)
R^2	0.903	0.980	0.801
Observations	2118	2121	2121
Control variables			
Year dummies	Yes	Yes	Yes
Household composition	Yes	Yes	Yes
Household FE	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Clustered standard errors at village level are in parentheses.

Note: The sample is limited to households where three or more generations were present in 2008. *Average years of education* is computed from years of education of all household members who are at least 25 years old. The model are in the spirit of Generalized Difference-in-Differences, i.e. with household fixed effects, where *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. *Year 2010* and *Year 2013* captures any time effect of year 2010 and 2013. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+.

Table B.3: Effect of pension on child outcomes – alternative cohort definition

	ITT		LATE	
	12-17	12-19	12-17	12-19
Dependent variable	(1)	(2)	(3)	(4)
School enrollment	0.055	0.030	0.190	0.103
	(0.051)	(0.041)	(0.148)	(0.118)
Child work	-0.081*	-0.063	-0.277*	-0.211*
	(0.049)	(0.041)	(0.149)	(0.122)
Literacy	0.033	0.010	0.112*	0.034
	(0.020)	(0.021)	(0.057)	(0.060)
F-statistic 1st stage			39.877	48.588
Observations	1594	2056	1589	2050
Control variables				
Child and family variables	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in 4, 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 *Eligible/Pension HH* in separate regressions. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table B.4: Effect of pension on child outcomes – alternative outcome measures

	ITT			LATE		
Dependent variable	6-18 (1)	6-11 (2)	12-18 (3)	6-18 (4)	6-11 (5)	12-18 (6)
Student	0.045	0.021	0.065	0.155*	0.075	0.215*
	(0.030)	(0.043)	(0.043)	(0.093)	(0.131)	(0.125)
Child work	-0.068**	-0.046	-0.080*	-0.235**	-0.167	-0.265*
(Outside HH farm/business)	(0.029)	(0.034)	(0.045)	(0.097)	(0.112)	(0.136)
Observations	3400	1573	1827	3393	1563	1821
Control variables						
F-statistic 1st stage				54.061	32.68	45.302
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4-6, as well as for *Household composition*, i.e. 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 *Eligible/Pension HH* in separate regressions. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In LATE specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

C Gender disaggregated results: Comparing ITT and LATE

Table C.1: Effect of pension on school enrollment – by gender

	ITT						LATE					
	6-18		6-11		12-18		6-18		6-11		12-18	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Pension Eligible/Recipient	0.032	0.055	-0.091	0.035	0.122	0.084	0.109	0.293	-0.316	0.172	0.363	0.606
	(0.065)	(0.057)	(0.076)	(0.081)	(0.093)	(0.082)	(0.196)	(0.274)	(0.308)	(0.230)	(0.265)	(0.594)
Δ Female Eligible/Recipient	-0.013	-0.062	0.002	-0.090	-0.060	-0.065	-0.018	-0.292	-0.128	-0.302	-0.093	-0.508
	(0.067)	(0.057)	(0.065)	(0.089)	(0.097)	(0.075)	(0.225)	(0.264)	(0.269)	(0.257)	(0.315)	(0.517)
Δ Male + Female Eligible/Recipient	0.031	-0.039	-0.035	0.013	0.046	-0.087	0.047	0.024	0.021	0.126	0.056	0.012
	(0.052)	(0.045)	(0.061)	(0.064)	(0.073)	(0.063)	(0.138)	(0.141)	(0.188)	(0.170)	(0.181)	(0.225)
F-statistic 1st stage	-	-	-	-	-	-	10.485	2.12	2.341	3.551	7.806	0.773
R^2	0.640	0.633	0.662	0.592	0.710	0.700	0.313	0.355	0.277	0.306	0.282	0.334
Observations	1670	1730	794	779	876	951	1656	1718	780	772	872	943
Control variables												
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible/Recipient	0.019	-0.007	-0.089	-0.055	0.062	0.019	0.089	-0.001	-0.433*	-0.136	0.264	0.099
	(0.054)	(0.045)	(0.064)	(0.064)	(0.079)	(0.069)	(0.192)	(0.117)	(0.253)	(0.182)	(0.239)	(0.171)
Male Eligible/Recipient	0.032	0.055	-0.091	0.035	0.122	0.084	0.107	0.287	-0.306	0.169	0.351	0.606
	(0.065)	(0.057)	(0.076)	(0.081)	(0.093)	(0.082)	(0.191)	(0.267)	(0.294)	(0.225)	(0.253)	(0.594)
Male + Female Eligible/Recipient	0.050	-0.047	-0.124	-0.042	0.108	-0.068	0.136	0.022	-0.405	-0.007	0.318*	0.111
	(0.064)	(0.053)	(0.081)	(0.070)	(0.089)	(0.080)	(0.158)	(0.153)	(0.247)	(0.156)	(0.187)	(0.304)

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In the left panel (*Reduced form*), *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman). In the right panel (*LATE*), *Male (Female / Male + Female) Recipient* indicates whether a male (female / male and female) household member receives the pension after becoming eligible due to the reform. $\Delta Female(Male + Female)Recipient$ measures the additional effect if a woman (man and woman) receives the pension after becoming eligible due to the reform compared to a man (the individual effects of a man and a woman).

Table C.2: Effect of pension on child work – by gender

	ITT						LATE					
	6-18		6-11		12-18		6-18		6-11		12-18	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)	Boys (7)	Girls (8)	Boys (9)	Girls (10)	Boys (11)	Girls (12)
Pension Eligible/Recipient	-0.062	-0.051	-0.089	0.013	-0.041	-0.119	-0.160	-0.164	-0.341	0.054	-0.056	-0.681
	(0.056)	(0.049)	(0.064)	(0.057)	(0.093)	(0.078)	(0.185)	(0.229)	(0.283)	(0.161)	(0.243)	(0.628)
Δ Female Eligible/Recipient	-0.015	-0.037	0.033	-0.042	-0.043	-0.009	-0.185	-0.100	0.019	-0.157	-0.259	0.300
	(0.056)	(0.053)	(0.048)	(0.060)	(0.098)	(0.080)	(0.220)	(0.235)	(0.236)	(0.186)	(0.302)	(0.569)
Δ Male + Female Eligible/Recipient	0.036	0.018	-0.022	-0.033	0.090	0.076	0.161	0.095	-0.014	0.007	0.257	0.057
	(0.049)	(0.036)	(0.042)	(0.032)	(0.085)	(0.055)	(0.145)	(0.118)	(0.157)	(0.108)	(0.187)	(0.234)
F-statistic 1st stage	-	-	-	-	-	-	10.485	2.12	2.341	3.551	7.806	0.773
R^2	0.635	0.625	0.437	0.429	0.647	0.669	0.242	0.271	-0.117	0.079	0.266	0.157
Observations	1670	1730	794	779	876	951	1656	1718	780	772	872	943
Control variables												
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible/Recipient	-0.078	-0.088**	-0.056	-0.028	-0.084	-0.127*	-0.342*	-0.262**	-0.310	-0.105	-0.314	-0.381**
	(0.054)	(0.037)	(0.060)	(0.044)	(0.088)	(0.066)	(0.204)	(0.103)	(0.247)	(0.125)	(0.260)	(0.183)
Male Eligible/Recipient	-0.062	-0.051	-0.089	0.013	-0.041	-0.119	-0.156	-0.161	-0.330	0.053	-0.054	-0.681
	(0.056)	(0.049)	(0.064)	(0.057)	(0.093)	(0.078)	(0.180)	(0.225)	(0.266)	(0.158)	(0.234)	(0.628)
Male + Female Eligible/Recipient	-0.042	-0.071*	-0.077	-0.061	0.006	-0.051	-0.179	-0.168	-0.317	-0.097	-0.056	-0.323
	(0.059)	(0.041)	(0.060)	(0.039)	(0.099)	(0.070)	(0.158)	(0.117)	(0.215)	(0.087)	(0.201)	(0.301)

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In the left panel (*Reduced form*), *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman). In the right panel (*LATE*), *Male (Female / Male + Female) Recipient* indicates whether a male (female / male and female) household member receives the pension after becoming eligible due to the reform. $\Delta Female(Male + Female)Recipient$ measures the additional effect if a woman (man and woman) receives the pension after becoming eligible due to the reform compared to a man (the individual effects of a man and a woman).

Table C.3: Effect of pension on literacy – by gender

	ITT						LATE					
	6-18		6-11		12-18		6-18		6-11		12-18	
	Boys (1)	Girls (2)	Boys (3)	Girls (4)	Boys (5)	Girls (6)	Boys (7)	Girls (8)	Boys (9)	Girls (10)	Boys (11)	Girls (12)
Pension Eligible/Recipient	-0.006	0.042	-0.027	0.035	-0.004	0.043	0.006	0.197	0.006	0.122	-0.020	0.241
	(0.040)	(0.035)	(0.073)	(0.066)	(0.016)	(0.035)	(0.116)	(0.162)	(0.266)	(0.187)	(0.040)	(0.250)
Δ Female Eligible/Recipient	-0.025	-0.017	-0.068	-0.036	0.010	0.009	-0.130	-0.114	-0.364	-0.108	0.041	-0.085
	(0.040)	(0.033)	(0.076)	(0.077)	(0.017)	(0.023)	(0.130)	(0.148)	(0.249)	(0.221)	(0.053)	(0.200)
Δ Male + Female Eligible/Recipient	0.012	0.008	0.034	-0.004	-0.018	0.019	0.073	0.041	0.213	0.020	-0.043	0.047
	(0.028)	(0.031)	(0.056)	(0.060)	(0.023)	(0.028)	(0.077)	(0.081)	(0.164)	(0.147)	(0.041)	(0.081)
F-statistic 1st stage	-	-	-	-	-	-	10.485	2.12	2.341	3.551	7.806	0.773
R^2	0.556	0.519	0.705	0.635	0.582	0.565	0.206	0.150	0.318	0.303	0.211	-0.074
Observations	1670	1730	794	779	876	951	1656	1718	780	772	872	943
Control variables												
Child and family variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female Eligible/Recipient	-0.031	0.025	-0.095	-0.001	0.006	0.052	-0.124	0.082	-0.359*	0.009	0.021	0.156*
	(0.032)	(0.032)	(0.063)	(0.055)	(0.015)	(0.037)	(0.111)	(0.077)	(0.214)	(0.151)	(0.045)	(0.085)
Male Eligible/Recipient	-0.006	0.042	-0.027	0.035	-0.004	0.043	0.006	0.193	0.006	0.119	-0.019	0.241
	(0.040)	(0.035)	(0.073)	(0.066)	(0.016)	(0.035)	(0.113)	(0.158)	(0.257)	(0.183)	(0.038)	(0.250)
Male + Female Eligible/Recipient	-0.019	0.032	-0.061	-0.005	-0.012	0.071*	-0.051	0.123	-0.146	0.031	-0.021	0.203
	(0.038)	(0.035)	(0.073)	(0.066)	(0.023)	(0.036)	(0.090)	(0.094)	(0.209)	(0.135)	(0.039)	(0.127)

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for individual and household characteristics reported in Tables 4 - 6, as well as for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In the left panel (*Reduced form*), *Male (Female / Male + Female) Eligible* indicates whether a male (female / male and female) household member was eligible to receive the pension after the reform. $\Delta Female(Male + Female)Eligible$ measures the additional effect if a woman (man and woman) was eligible to receive the pension after the reform compared to a man (the individual effects of a man and a woman). In the right panel (*LATE*), *Male (Female / Male + Female) Recipient* indicates whether a male (female / male and female) household member receives the pension after becoming eligible due to the reform. $\Delta Female(Male + Female)Recipient$ measures the additional effect if a woman (man and woman) receives the pension after becoming eligible due to the reform compared to a man (the individual effects of a man and a woman).

D First Difference Model

Table D.1: Effect of pension on school enrollment

	OLS with FD			2SLS with FD		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	-0.013	-0.056*	0.027	-	-	-
	(0.025)	(0.033)	(0.037)			
Pension HH	-	-	-	-0.044	-0.206*	0.083
				(0.083)	(0.123)	(0.118)
Age	0.304***	0.516***	0.034	0.305***	0.530***	0.034
	(0.023)	(0.057)	(0.053)	(0.023)	(0.057)	(0.053)
Age^2	-0.008***	-0.015***	-0.001	-0.009***	-0.015***	-0.001
	(0.000)	(0.002)	(0.001)	(0.000)	(0.002)	(0.001)
Total HH income	0.014*	-0.000	0.022**	0.015*	0.008	0.022**
	(0.008)	(0.011)	(0.011)	(0.008)	(0.012)	(0.011)
Education of HH head	0.003	0.004	0.003	0.003	0.003	0.003
	(0.006)	(0.006)	(0.010)	(0.006)	(0.006)	(0.010)
F-statistic 1^{st} stage	-	-	-	55.068	29.127	46.648
R^2	0.164	0.230	0.076	0.160	0.147	0.067
Observations	3241	1465	1776	3241	1465	1776
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes

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

Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In 2SLS specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table D.2: Effect of pension on child work

	OLS with FD			2SLS with FD		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	-0.035	-0.045*	-0.034	-	-	-
	(0.023)	(0.025)	(0.038)			
Pension HH	-	-	-	-0.119	-0.167*	-0.104
				(0.081)	(0.099)	(0.120)
Age	-0.108***	-0.009	-0.055	-0.106***	0.001	-0.055
	(0.023)	(0.014)	(0.034)	(0.022)	(0.017)	(0.034)
Age^2	0.004***	0.000	0.001	0.003***	0.000	0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Total HH income	-0.010	-0.012	-0.008	-0.007	-0.005	-0.007
	(0.009)	(0.009)	(0.013)	(0.009)	(0.010)	(0.012)
Education of HH head	-0.005	-0.003	-0.009	-0.006	-0.004	-0.009
	(0.005)	(0.003)	(0.010)	(0.005)	(0.004)	(0.010)
F-statistic 1^{st} stage	-	-	-	56.255	29.825	47.536
R^2	0.068	0.050	0.056	0.039	-0.126	0.044
Observations	3296	1519	1777	3296	1519	1777
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In 2SLS specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.

Table D.3: Effect of pension on literacy

	OLS with FD			2SLS with FD		
	6-18	6-11	12-18	6-18	6-11	12-18
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible HH	-0.003	-0.040	0.026*	-	-	-
	(0.016)	(0.028)	(0.014)			
Pension HH	-	-	-	-0.008	-0.146	0.080*
				(0.052)	(0.104)	(0.044)
Age	0.168***	0.438***	0.056	0.168***	0.447***	0.056
	(0.014)	(0.042)	(0.036)	(0.014)	(0.042)	(0.037)
Age^2	-0.005***	-0.012***	-0.001	-0.005***	-0.013***	-0.001
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Total HH income	0.009	0.008	0.005*	0.009	0.014	0.005
	(0.006)	(0.012)	(0.003)	(0.006)	(0.012)	(0.003)
Education of HH head	0.005	0.010	-0.001	0.005	0.009	-0.001
	(0.004)	(0.008)	(0.003)	(0.004)	(0.008)	(0.003)
F-statistic 1^{st} stage	-	-	-	57.142	30.641	48.202
R^2	0.102	0.140	0.099	0.101	0.101	-0.005
Observations	3307	1524	1783	3307	1524	1783
Control variables						
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household composition	Yes	Yes	Yes	Yes	Yes	Yes

***, ** and * indicate significance at the 1%, 5% and 10% level respectively. Standard errors are in parentheses and clustered at the village level.
Note: The sample is limited to children living in households where three or more generations were present in 2008. All models control for *Household composition*, i.e. the number of male and female household members in separate age groups 0-4, 5-9 ... 65-69,70-79, 80-89 and 90+. In reduced form specifications *Eligible HH* indicates whether a household member was eligible to receive the pension due to the reform. In 2SLS specifications *Pension HH* indicates whether a household member receives the pension either before or after the reform.