รายงานวิจัยฉบับสมบูรณ์

โครงการ บทบาทของสภาพครัวเรือนต่อการพัฒนาคุณภาพกำลังแรงงานในอนาคต

โดย เนื้อแพร เล็กเฟื่องฟู และคณะ

คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

กันยายน 2561

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Influences of family structures during childhood on human capital development: lessons from a longitudinal data of Thai households

คณะผู้วิจัย

1. ดร. เนื้อแพร เล็กเฟื่องฟู (คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย)

2. ดร. ธัญมัชฌ สรุงบุญมี (คณะเศรษฐศาสตร์ มหาวิทยาลัยขอนแก่น)

ชุดโครงการ พัฒนาองค์ความรู้และนโยบายเศรษฐกิจและสังคมของครัวเรือนไทย

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กิตติกรรมประกาศ

งานวิจัยฉบับนี้สำเร็จลงได้ด้วยดี เนื่องจากได้รับความกรุณาอย่างสูงจาก รองศาสตราจารย์ ดร.วีระชาติ กิเลนทอง ผู้อำนวยการ สถาบันวิจัยเพื่อการประเมินและการออกแบบนโยบาย (RIPED) ณ มหาวิทยาลัยหอการค้าไทย ที่อนุเคราะห์ข้อมูลครัวเรือนไทยชุด Townsend Thai Data และให้คำแนะนำปรึกษาด้วยความเอาใจใส่อย่างดียิ่ง ตลอดจนอำนวยความสะดวกเกี่ยวกับการใช้ข้อมูลชุดนี้ คณะผู้วิจัยขอกราบขอบพระคุณเป็นอย่างสูงไว้ ณ ที่นี้

ขอขอบพระคุณ ดร.กฤษฎ์เลิศ สัมพันธารักษ์ ดร.ภัททา เกิดเรือง ดร.อนันต์ ภาวสุทธิไพศิฐ ซึ่งเป็นผู้ทรงคุณวุฒิประเมินข้อเสนอโครงการและได้ให้คำแนะนำเพื่อปรับปรุงวิธีการวิจัย และขอขอบพระคุณผู้ประสานงานโครงการ คุณวาสิณี จันทร์ธร สถาบันวิจัยเพื่อการประเมินและการออกแบบนโยบาย (RIPED) ที่ให้คำปรึกษาแนะนำเกี่ยวกับการใช้ข้อมูล Townsend Thai Data อำนวยความสะดวกในการจัดเตรียมข้อมูลชุดดังกล่าว และทีมงานของ Townsend Thai Data ทุกท่าน และขอขอบคุณ คุณไฟรุส อับดุลเลาะห์ ที่ประสานงานด้านธุรการที่ทำให้งานวิจัยดำเนินไปได้อย่างราบรื่น

ผู้วิจัยขอขอบพระคุณที่ปรึกษาชุดโครงการ ศ.นพ.สุทธิพันธ์ จิตพิมลมาศ ขอขอบพระคุณประธานกรรมการชุดโครงการ ดร.อัจนา ไวความดี รวมถึงคณะกรรมการทุกท่าน ได้แก่ ดร.ปัทมาวดี โพชนุกูล คุณรัจนา เนตรแสงทิพย์ ดร.ปิติ ดิษยทัต ที่ให้ความกรุณาพิจารณางานวิจัย ให้ข้อคิดเห็นและข้อเสนอแนะเพื่อปรับปรุงงานวิจัยครั้งนี้ตลอดมา

อนึ่ง ผู้วิจัยหวังว่า งานวิจัยฉบับนี้จะมีประโยชน์ต่อผู้ที่เกี่ยวข้อง ไม่ว่าจะเป็นผู้วางนโยบายของภาครัฐ หรือภาควิชาการ ข้อบกพร่องต่าง ๆ ที่อาจจะเกิดขึ้นนั้น คณะผู้วิจัยขอน้อมรับผิดเพียงฝ่ายเดียว และยินดีที่จะรับฟังข้อคิดเห็นและคำแนะนำจากทุกท่านที่ได้เข้ามาศึกษางานวิจัยนี้ เพื่อเป็นประโยชน์ในการพัฒนางานวิจัยต่อไป

ดร.เนื้อแพร เล็กเฟื่องฟู
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ดร.ธัญมัชฌ สรุงบุญมี
คณะเศรษฐศาสตร์ มหาวิทยาลัยขอนแก่น

พ.ศ. 2561

1. Introduction

The research project aims to estimate the size and patterns of potential impact of different household structures on human capital development.

In rural Thailand, we have observed a stark pattern of a "skipped-generation" household structure over the years. Evidence from the 2006 National Children and Adolescence Survey reveals that over 16 percent of children aged 0-4 years are living in this skipped generation household. At the highest spectrum, over 21 percent of children in the Northeast were found to be living under the skipped generation household (see Table 1). This evolution of household structure is also found in Townsend Thai Monthly Survey (see Figure 1, Pawasutipaisan, 2016). A skipped-generation household is defined as a household with the head of household is of grandparent generation living with grandchildren generation but with the absence of the second, middle generation.

Many studies observe that among different household structures (both Thailand and other countries), households with working-age members living outside benefit from the increase of household's cash-on-hand. While some findings suggest that remittances mainly allow for higher consumption while they rarely fund productive investments (for example Durand et al 1996, Brown and Ahlburg 1999, Bryan et al 2014), the others find evidence supporting higher investments in other cases (for example Cox-Edwards and Ureta 2003, Adams and Cuecuecha 2010) (see Yang 2011 for a survey).

On the one hand, young children living under a skipped-generation household may benefit more from higher cash flow into the family. On the other hand, high remittances neither guarantee higher child-specific consumption nor increase in child investments. Moreover, they receive less parental interactions with their active-age parents (Aizer et al, 2015; Fitzsimons et al, 2012). With reference to early childhood literature, living in a skipped-generation household may be disadvantageous to the human capital development of the child (ren). The literature hasshown that spending on children is higher when money is transferred to the child's mother, in comparison to other household members.

As a result, the net impact of skipped-generation on children's human capital development remains inconclusive. If household members pool their resources together and thus behave in the manner predicted by collective household models (e.g. Becker and Tomes 1976; Mestieri, Schauer and Townsend, 2017), we may not observe differences in children's outcomes from households with the same total resources but differed in their family structure.

Instead, if households in fact make household decisions more strategically according to cooperative bargaining frameworks, we should expect to observe difference in human capital outcomes among resource-equivalent households, depending on who the main carers of the children are (Chiappori, 1988, 1992).

Focussing on the implications of different household structures on human capital development, we can disentangle its influence coming from two channels: the income effect and the quality of childrearing. Children growing up in a skipped-generation household may face a trade-off between a rise in household income (via parents working outside in a better paid job) and a decline in time investment from own parents. However, the extent of this trade-off between these two channels depends heavily on decision-making *within* the household (so-called intra-household decision).

In Gary Becker's model, a household is a unitary entity whereby all members in the household allocate roles and tasks according to own comparative advantages (Becker 1976, 1981). And because all members are assumed to share common interests without personal conflicts, they maximise the benefits of the household as a whole. All resources are pooled together and the household is characterised by a unique utility function. Under this framework, young children living in a skipped generation would not be strongly disadvantageous from the absence of own parents. This is because grandparents share the same common goal as altruistic parents (preferences are characterised by one utility function). The loss of own parental time spending can be compensated by an increase in household income from inwards remittances.

However, empirical findings in the literature have presented strong evidence against the case of full resource pooling in household decision making. Using data on household expenditure behaviours, Thomas and Schultz (1990), Lundberg, Pollak and Wales (1997) reveal the deterministic role of owner of initial endowment. That is, there are biases on spending towards those who earn the pooled resources. This implies that remittances may not be directed to the children of outside parents as much as Becker's theory may have predicted. Therefore, young children in a skipped generation household can stand worse off from parental absence.

In fact, scholarly work by Chiaporri (1988, 1992) show that on average, households are not characterised by a unique utility function but they have individualistic elements. However, his "collective" models, households work together to attain Pareto efficient outcome with. The "sharing rule" defines how resources are distributed. This conceptual framework extends to bargaining models (under symmetric information). The extended model is aimed at formalizing the "targeting" notion that changes in relative powers would generate changes in behaviour even when total resources are kept constant (for example Blundell et al 2005 look at couple's expenditure on children)

The above implies that grandparents and parents of the child may no longer share the exact altruistic preferences for child's development. A skipped-generation family with strong bargaining power leaning towards the grandparents would make different allocative decisions that that with weaker bargaining power. This leads to different quantity and quality of resources going toward the children within this household structure. One can imagine grandparents with large savings and assets could possess a more advantageous bargaining position that grandparents with full reliance of remittance from their offspring.

Alternatively, even with fully altruistic parents and grandparents, the role of imperfect information can play a large role in determining the quality of child development. Laitner (1992), Cunha (2013) and Cunha, Culhane and Elo (2013) point that investments in children are a process of trials and errors for most carers. That is it is very hard for each individual carer to personally evaluate the effectiveness of their actions on the development of their child. Therefore, carers who can rapidly receive and adopt new, updated information stand much better chances to adjust their investment behaviours. In our context, it is more likely that younger generations are better exposed to new information than older ones. What is

more, they are more likely to adapt to it whereas older generations are more likely to prefer to stick with status-quo information (Aizer and Stroud, 2011; Fitzsimons et al, 2012).

All of aforementioned above leave the questions open on how exactly household structures may affect the trajectory of human capital development of children, both in the short run and longer run. In this work, we exploit the longitudinal structure at the individual and household level of Townsend Thai Data (Annual Rural and Annual Urban Surveys) in order to track this trajectory.

The data allows us to identify a sample of children born and lived in various household settings (for example, 3-generation household; standard 2-generation household; and skipped-generation household) and track their outcomes over the years. Using the longitudinal structure, we can track the information on if and when household structure may have switched *within* a child. This allows us to potential identify sensitive ages along the childhood at which living in particular household structures could be disadvantageous. The data also contains information on annual remittances sent back from outside members, allowing us to investigate potential compensatory effect of supplementary income on schooling outcomes as well as out-of-pocket education expenditure. Unfortunately, we do not have information on parental time investment available. Instead, the data allows us to calculate for the duration of parental absence along the childhood period to estimate the upper-bound effect of the quantity of time-investment channel.

Our empirical strategies do not directly estimate for the role of relative bargaining power on child development. One could think of imperfect monitoring (Chen 2006, 2013, Ashraf et al 2011) as a factor influencing the relative power. Therefore, by holding total household income constant in the regressions, we essentially aim to see how child-specific expenditure is related to the absence of parents, within a comparable set of households. When available, we also control for head of household's intention to give inherent as a proxy for relative power.

The longitudinal structure of the data also allows for fixed-effect regressions. Using birth-cohort fixed effect, we are able to further mitigate problems of unobserved factors that are specific to each birth-cohort and therefore may bias the estimations. It is worth noting that household structure is a result of choices made by family members who decide whether or not they wish to stay behind with own children or prefer to stay away. To mitigate the problem of self-selection, we will employ the method of two-staged least square later in our empirical analysis following the framework of Felkner and Townsend (2011) and Bartik (1991). They exploit the geographical capabilities of villages and their exogenous physiographic conditions (access to road systems, location of markets) as key variations, which influence occupation choices on local individuals.

2. Conceptual framework

Consider a simple framework in which there are three generations living in a household, a grandparent (first generation) (*m*), a parent (second generation) (n) and a child (third generation) (k). There are two decision makers, a parent and a grandparent, who share one public good, *z*, whilst consume private goods, *x*. We may refer to the public good, *z*, as the child's quality (or human capital). Each member lives for three periods. m and n are productive participants in the labour market.

The marginal product of labour is decreasing with age but increasing with her childhood human capital. Therefore, marginal wage rate of grandparent (w_m) is less than that of parent (w_n). Let l_m and l_n represent labour supply of grandparent and parent, respectively.

Preferences of decision makers at a given time period can be characterised as

$U_i(x_i, z)$ with $l_i = l_m + l_n$ for $i = m, n.$ **(1)**

We assume that the child receives her utility directly from her contemporaneous human capital quality. Child's quality is produced child-specific consumption (x_k) and time investments (l_m, l_n), subjected to total household budget, *Y*.

$z = z(l_m, l_n, x_k)$ **(2)**

subject to

$Y = l_m w_m + l_n w_n$ **(3)**

The lifetime total utility function for each household member, $U_{i,T}$, is represented simply as:

$U_{i,T} = z_{i,t=1} + U_{i,t=2}(x_{i,t=2}, z_{k,t=2}) + U_{i,t=3}(x_{i,t=3}, z_{k,t=3})$ **(4)**

where $z_{k,t=1}$ represents quality of herself as a child, $z_{k,t=2}$ represents quality of her child, $z_{k,t=3}$ represents quality of her grandchild.

Note that the total lifetime utility function characterised above indicates that a grandparent gains from grandchild's quality in only one period. In a lifetime, the parent also directly enjoys the child quality only once. But because the childhood human capital determines the labour productivity in the next period, the parent therefore indirect reaps the benefit of own child quality again when she is a grandparent.

Under a given relative intra-household bargaining power and total resources, the conceptual model implies that the parent will have relative stronger incentives to invest in her own child than the grandparent.

3. Empirical strategies

We exploit the longitudinal structure at the individual and household level of Townsend Thai Data (Annual Rural and Annual Urban). The data structure allows us to obtain information on (i) the timing and the duration on the "exposure" of different household types among children of the household[1], (ii) timing of switching of household structures during the course of childhood, (iii) the evolution of outcomes (education participation, years of schooling and out-of-pocket education expenditure) over time of individuals, (iv) key covariates for understanding potential mechanisms, for instance household finances, household business ownership and remittance patterns.

Households are classified according to their contemporary composition of household members (identified through individual member's relationship to the head of household). Among households with children (defined as members ages 0 to 12 years old at each survey year), there are three household types: (i) 3-generation (grandparent, parent and children), (ii) traditional 2-generation (parent and children) and (iii) skipped generation (grandparent and children). Largely, we define childhood as the life period of ages 0-12 years, with ages 0-5 years will be referred to as early childhood.

We can write a baseline reduced-form relationship between human capital development (HC_a), and household structure (F_a) at a point in time of the life-cycle (age = a) as in Equation 1. For our interest, F_a is equal to 1 if an individual who lived in a skipped-generation family when she was at age *a*, and is equal to 0 if she lived in either a 3-generation or a standard 2-generation household when she is *"a"* years old.

$$HC_a = \alpha_a F_a + \mu_a \quad (\mathbf{5})$$

To investigate if there is any persistent long-arm impact of household structure on later outcomes, we can write the reduced form relationship as in Equation 2 where HC_{a+t} is a human capital outcome at age a+t and α_{a+t} now captures the effect of the *t*-lagged family structure observed when age a (that is *t* years ago).

$$HC_{a+t} = \alpha_{a+t} F_a + \mu_{a+t} \quad (\mathbf{6})$$

Because we observe, for each individual, her family structure at every childhood age, we can expand Equation 6 along the full range of ages and include the full set of age-specific family structure as shown in Equation 7.

$$HC_{a+t} = \alpha_{a+t} F_{a+t} + \cdots + \alpha_{a=0} F_{a=0} + \nu_{a+t} \quad (\mathbf{7})$$

In order to investigate potential compensatory role of remittances sent back to the household, we extend Equation 3 and a set of household account variables, D_a, that are specific at each age, including inwards remittances, outwards remittances, (log of) net household income (equivalised) and (log of) business expenses (equivalised). Therefore, β_{a+t} capture the "income effect" from age 0 to age $a+t$ on human capital outcomes at age $a+t$.

[1] For each household at each wave, we will need to identify the young children members, their biological parents and the presence of the parents in the household.

$$HC_{a+t} = \left(\alpha_{a+t}F_{a+t} + \alpha_{(a+t)-1}F_{(a+t)-1} + \cdots + \alpha_{a=0}F_{a=0}\right) +$$
$$(\beta_{a+t}D_{a+t} + \beta_{(a+t)-1}D_{(a+t)-1} + \cdots + \beta_{a=0}D_{a=0}) + \nu_{a+t} \quad (\mathbf{8})$$

At any rate, all equations described above can only extract the size of the correlation. To mitigate omitted variable biases, in addition we run birth-cohort fixed effect specifications. This allows us to take care of unobserved factors that are specific to each birth cohort in a given survey year.

Felkner and Townsend (2011) exploit the geographical capabilities of villages and their exogenous physiographic conditions (access to road systems, location of markets) as key variations, which influence occupation choices on local individuals. More advantageous local conditions encourage more individuals to become local entrepreneurs and therefore discourage out-migration. We consider variables that capture local economic conditions during the childhood ages. Availability of job opportunities in local factories reflects easy access to income-generating activities without long-distance migration. Therefore, this can be a strong incentive for parents to stay behind with the children. Subsequently, it may influence decisions of new parents whether or not to move away from home or stay intact with their offspring.

In effect, this impacts the incidence as well as the duration of parental presence at home, for a given child at a given age profile. Nightlight data from satellite also capture the overall local economic growth (Henderson et al., 2012). All local variables used for our instruments are at district-level, specifically for a given age of the children in the survey. We allow for lagged effect of local economic conditions, $\boldsymbol{L_{a-s}}$, on the contemporaneous family structure. That is, a decision to migrate out of the area can be influenced by not only the contemporaneous conditions but also past economic conditions of her district of residence.

$$F_a = \sum_{s=0}^{a} \boldsymbol{\pi}\, \boldsymbol{L_{a-s}} + \ \mu_a \quad (\mathbf{9})$$

4. Summary statistics of households in Townsend Annual Surveys

Figure 1, Figure 2.A. and Figure 2.B. present an exploratory overview of the distribution of various household structures observed in the Townsend Rural Monthly, Rural Annual and Urban Annual, respectively. We classify households according to the composition of generations of family members "currently" living in the same household. Thai households in the Townsend data range from a sole member living alone to a family of 4 generations living under the same roof.

The standard 2-generation household with parents living with own children is the most common in both rural and urban samples across the periods of the data. The second most common is the 3-generation household with the head of household (older member of the family) lives with own children and grandchildren. From the 20 years period in Townsend sample, we also observe two important trends. There is a rise share of one-generation (including lone-member) households over time. Similarly, we observe an increase in the so-

called skipped generation household (grandchildren living with older head of household and absent parents). Among Rural Annual sample, in the first wave (1997), the combination of these two types of household accounts for only 15 percent. By the 2010 wave, they count as 30 percent of all households in the sample. We find a similar account in the urban sample.

Figure 3 summarises the share of skipped-generation household *among the households with young (aged 0-12) family members*. The survey-average share is 12 percent for the rural sample, with the survey year 2010 being the highest. From 1997 to 2010, we observe the rising trend of rural families as a skipped generation household. The rate becomes more stable, at approximately 16 percent from 2010 onwards. For the urban sample, the share of skipped generation household is noticeably smaller but there is a somewhat increasing trend. The survey-average share is 7.28 percent for the years 2005 – 2015, starting at 6.39 percent in 2005 and moving up to 8.69 percent in 2015.

Next, we turn to examine the size of our potential individuals of interest in Townsend Thai survey samples. Our research interest focuses on how family structures during childhood may influence the course of human capital development over the ages. Therefore, we pay close attention to household members who are aged 0-12 at each earlier wave. With the longitudinal structure of the Townsend Thai Surveys, we are able to track these individuals across time, when we can identify them in later waves. Table 2.A and 2.B list the number of *young* family members by age group for all available survey waves for the Rural Annual and the Urban Annual Townsend Surveys. We sub-classify the young members according to their relationship to the household head (i) own offspring and (ii) grandchild status. The columns "new born" identify the number of *new-entry* individuals at each survey wave. Notice that most young members (aged 0-1 years) found earlier in the Rural Annual surveys are grandchildren. A similar pattern is observed in the urban households. Having grandparents living in the same household as their grandchildren, especially in recent years, has become a norm, and not the exception.

[Table 2.A. about here]

[Table 2.B. about here]

Using the longitudinal structure (at individual-level) of the Townsend Data, we are able track the history of family structure throughout her childhood (ages 0-12 years old) for a group of individuals in the dataset. Specifically, for the Annual Rural, we are able to track the history of past family structure for those born between 1985 (aged 12 at the 1997 survey wave) and 2015 (aged 0 at the 2015 wave). Figure 4 plots the age-profile of the share of children growing up in a skipped-generation household (pulled across all survey waves). Alarmingly, the share of children living in skipped-generation households increases as they grow older. At very young ages (ages 0-2), around 13 percent of rural children live in such a household. By age 5, the share almost doubles and stays around 20 percent.

[Figure 4 about here]

Rural parents tend to stay with their children (in the same surveyed household) when the children are young. But the outflow of parents is high and constant. Because of the constant proportion of children from age 5 to age 12 living in a skipped-generation household, it suggests that once parents have left the rural household, they would not reunite with their children for a certain long period of time. Children in urban settings experience a similar pattern of family structure changes, though to a smaller degree. While a smaller proportion of younger children ages 0 to 3 experience parental absence, the proportion grows larger as the children age, reaching its maximum around ages 7 – 9. However, parents and children reunite once children reach their teenage years. The rate of skipped generation exposure falls somewhat after urban children reach age 10 in the urban sample. The lower proportion of children living in skipped-generation households at older ages seems to reflect parents' returns and not departures of older children from grandparents' households because there is a jump in the number of children living with their own parents after age 5 while the number of children living with grandparents after age 5 remains mostly flat (see table 2).

To see if there is heterogeneous pattern of children living in a skipped-generation household across each birth cohort, Figure 5 shows the proportion of children in each birth-cohort ever been growing up in a skipped generation household during ages 0 to 12 years old, for the rural and the urban sample separately. For the rural households, Figure 5 reveals that the exposure to a skipped-family has some birth-cohort specific trend. We observe an increasing trend between the cohort born in 1994 and peaked at the cohort born in 2006 (30.6% of the cohorts was growing up in a skipped-generation household at least once in their childhood period). Thereafter, the trend fluctuates somewhat but with a decreasing pattern. Interestingly, the pattern for urban households broadly tracks that of rural households, with minor deviations along the way. There seems to be a hump for birth years in the 2000's and a drop after 2010.

[Figure 5 about here]

Next, Tables 3.A and 3.B compare summary statistics of key family characteristics (household composition) and broad household financial account between 3-generation, standard 2-generation, and skipped-generation households. In terms of the composition of family members, the standard 2-generation households have younger heads of household (average age is 48 years old), and they are less likely to be headed by a female (27% compared to 37% in skipped-generation families). And they are also better educated, with higher share of household head with at least high school qualification (14%, compared to 4% in skipped-generation families). Surprisingly, for the rural households, there are no significant differences among all three types of family structures in term of gross household income and net household income. Skipped-generation households are less likely to own a business (30.5%) and therefore have lower level of business expenses per head than the standard 2-generation households.

[Table 3.A. about here]

For the urban sample, we also see some income disadvantage within skipped-generation households relative to the other two types. There is also a smaller prevalence of business ownership among skipped-generation households. The majority of these households are headed by females, and these heads of households are older on average, especially compared to 2-generation parents-offspring households. Skipped generation households have an average age for heads of households of about 61 years, whereas parents-offspring households have an average age of about 48 years for their heads of households. However, there is no remarkable difference in educational achievements among types of households.

Skipped-generation households, on average, receive higher remittances than other household types. To compare, they receive nearly 4 times more (in log term) than an average level received by a standard 2-generation rural household. In reverse, skipped-generation households sent out the least amount of remittances to family members living elsewhere. This pattern also holds for the urban sample, especially when we compare skipped-generation households to parents-offspring households. Though the difference in remittances received is not as remarkable as in the rural sample, one observes that remittances sent is much higher in parents-offspring households. An illustrative comparison would be that between remittances received and sent within these households. Whereas parents-offspring households receive and send similar amounts of remittances, skipped-generation households in the urban sample barely send anything out and receive a sizeable amount.

Among rural households, the value of reported household expenditure (pooled sample across 20 years) on education is approximately 6.7 log of Thai bahts (equivalent to 7,700 bahts). There is no statistical difference at the mean among the 3 types of family structure. We also observe no differences in value of household spending on food. In comparison, skipped-generation households in our rural sample spend less on repair than other families. This also reflects in the ratio of expenses on repair to total expenditure. Compared to other families, rural skipped-generation households spend proportionally higher fraction in education and food, but less on cloth and household repair. However, these differences are not statistically significant between each family type.

[Table 3.B. about here]

A similar pattern holds for urban households in the sample. We also see 3-generation households spending the most amount on education among all three types of muti-generation households, while the differences are not statistically significant. It is worth noting that educational spending is the only dimension where skipped-generation households are not the group that spend the least amount. In all other categories, skipped-generation households spend the least on average. When considering proportions out of household spending on each category, the results are even more telling. Urban skipped-generation households spend the highest proportion on education and food (eaten outside). We might take this to mean that these households are actually more devoted financially in terms of child rearing. Because household wealth and income is an important determinant of resources dedicated to children and therefore their outcomes, we control for various measures of household wealth in our

regression analysis when examining the relationship between household structure and child outcomes.

5. Estimation results

To examine the effect of household structure during childhood and later outcomes, we estimate regressions as specified in section 2. The main outcome of interest is total years of schooling achieved, but we also want to explore the mechanism by which it is achieved. To do so we also estimate the relationship between childhood household structures at the child's various ages and per-child education spending in the household. We also assess the relationship between household structure and remittances received to see whether this source of income helps to mitigate the impact family structure has on child future outcomes.

The main outcomes (total years of school) in our analysis come from the information in the latest survey wave we can track the individuals. Most individuals, we find them in the 2015 wave. For those we do not observe their schooling outcomes in the latest wave (2015), we supplement it with the latest possible year we can track. Among birth cohorts we can track for a considerable amount of time. As the rural sample covers a longer period than the urban sample, we are able to track individuals for a longer period than the urban sample. For the rural sample, the oldest birth cohort are born in 1994 and were age 3 in the first survey year in 1997. The youngest birth cohort in the rural sample are 5 years old in 2015 (normal age for starting school). The sample selected from the urban survey includes only the oldest birth year cohort in 2015 whose family structure we can observe at age 11, and cohorts that are at least 5 years of age in 2015 (school age).

The top age cut-off allows us to follow individuals as far into the future as possible after their exposure to their respective family structure. The lower age cut-off limits the sample to individuals who are already school-aged (5 and above). This sample selection criterion results in individuals ages 5 – 21 in both samples, although we will have family structure data going back further for more individuals in the rural sample. Townsend survey collect information on the highest education qualification of each individual member at every wave. We convert the qualification into the to-date highest years of schooling, where no education is assigned 0 year and completed bachelor degree (4-year course) is assigned 19 years of schooling. Note that for younger age cohorts, the years of schooling reflect their current level of education whilst for some older age cohorts, this reflects the completed qualification.

For a logical exposition, we start with the analysis of education investments across household structures, then explore remittances pattern across households. We proceed finally to the analysis of household structure and its relationship with years of schooling achieved.

5.1. Effects of growing up in a skipped family on education investments (out-of-pocket education expenditure)

There are both similarities and differences between rural and urban households in the sample. For this reason, we will present results separately for rural and urban households. Table 4 shows regression results under various specifications for the rural sample. First, we look at household out-of-pocket spending on education. We use the self-reported total education expenses in the Annual Survey and convert it to per-child (using the number of young members aged 0-12 in households) and take the log value[2]. Looking at mean household education spending during ages 0 – 5 years for the child, the effect of a skipped-generation home is negative and significant for exposures during ages 3 – 5 years, at about 1.25 log points. For education spending during the child's ages 6 – 9 or 10 – 12 years, household structure seems not to have any effect.

[Table 4 about here]

Overall education spending from ages 0 – 12 years, however, is significantly affected by exposure to skipped-generation home at ages 10 – 12. It appears that family structure in later childhood years is most important in driving the difference in education spending across household structures. These effects are visible even after controlling for cohort fixed effects. Another significant result but one whose explanation is not obvious is the higher mean education spending during ages 6 – 9 associated with skipped-generation household exposure during that age.

We also see a negative relationship between skipped-generation home and education spending during early childhood for the urban sample. Table 5 reports the regression results for urban households. Being exposed to a skipped generation household during ages 3 – 5 years is associated with reduced household spending on education by about 1.6 log points, after controlling for cohort effects. Mean education spending during ages 6 – 9 does not seem to be affected by family structure. Surprisingly, exposure during ages 10 – 12 is positively associated with *higher* education spending during the same age range by about 1.46 log points, controlling for cohort effects. Finally, mean education spending throughout childhood seems most negatively affected by exposure at ages 10 – 12. However, this negative effect is only nearly significant once cohort fixed effects have been controlled for.

[Table 5 about here]

5.2. Relationship between growing up in a skipped family and remittances

As originally suspected, skipped generation households tend to receive more remittances than other household structure. Though in the previous section we already see the average remittances received is higher in these households, regression analysis helps to filter out the

[2] To compute the log conversion, we apply the formula $\log(\text{expense}) = \log(\text{reported expense} + 1)$. This is so that for households with zero expense on education the log of per-capita education spending is equals to 0

effects from other factors. In regression analysis we can also show separately the effect of being exposed to a skipped-generation household structure at various age ranges. Finally, the set of explanatory variables help us better understand the factors that drive remittances in these households.

Table 6 shows the results for rural households. The first column shows a positive and significant effect of being in a skipped-generation household during the age of 0 to 12 (0 – 12) on remittances received. This effect is about 1.65 log points above those who never experienced a skipped-generation household. Once we separate the exposure to skipped-generation into during ages 0 – 5 and 6 – 12, the effect is slightly stronger for exposure during ages 6 – 12, at about 1.48 log points and 10% significance level, compared to about 0.81 log points for exposure during ages 0 – 5.

[Table 6 about here]

Another interesting pattern worth noting is that when we further separate the exposure periods into ages 0 – 2, 3 – 5, 6 – 9, and 10 – 12. We find that exposures during ages 6 – 9 are significant drivers of total childhood mean of remittances received, at about 2.6 log points. When we control for cohort (birth year) fixed effects, the pattern does not change though the magnitude of the effect falls slightly to 2.56 log points. It seems that parents of early age children who leave home either believe that child support during mid-childhood is more important than early childhood, or that their earning potential grow with their offspring. However, the former explanation seems more plausible given that remittances regress as children in these households become teenagers.

The urban sample shows a similar pattern though the age ranges do not completely align. Specifically, we find that there is a rise and fall of remittances throughout a child's life in urban settings, but these do not occur at the same age range as those in rural settings. Table 7 shows the regression results relating remittances to household structure for urban households. The first column shows a positive and significant effect of being in a skipped-generation household during the age of 0 to 12 (0 – 12) on remittances received. This effect is about 1.65 log points above those who never experienced a skipped-generation household. There is a slightly stronger effect for exposure during ages 0 – 5, at about 1.76 log points and 10% significance level, compared to about 1.4 log points and insignificant effect for exposure during ages 6-12.

[Table 7 about here]

When separating the age ranges into more detail, one finds that households with children ages 3 – 5 receive significantly more remittances than other types of households. Exposure during other age ranges do not affect the mean remittances received during childhood. Again, it seems that urban parents living away place more weight on child support in mid-childhood than early or late childhood[3]. Children exposed to a skipped-generation home during ages 3 –

[3] The mean remittances during childhood (age 0 – 12) are driven differently by exposure to skipped-generation at different ages, not that these estimates are actual remittances during each age range.

5 receive about 2.9 log points higher than those without any exposure. Controlling for cohort (birth-year) fixed effects, the effect on remittances become slightly higher at 2.96 log points, significant at the 10% level.

Taken together, these results offer both hope and pessimism. Children living in skipped-generation homes can expect larger remittances from their absent parents, which would translate to more resources available to them. At the same time, they cannot expect these above-average remittances to last throughout their childhood, as they will not be above average if parental absence occurs at later ages. Another common factor that drives incoming remittances is the age of the head of household. This would be advantageous for skipped generation homes as their heads are older on average. Intention to give inheritance is negatively related to incoming remittances, while business expenses and the number of businesses are associated with higher remittances. However, these relationships disappear once we control for cohort fixed-effects.

5.3. Effects of growing up in a skipped family on education outcomes (years of schooling)

The main outcome of interest in our current report is children's educational achievement. To assess the effect of household structure on this outcome, we estimate regression models first to observe overall variation across household types. We then proceed to add control variables that also explain variation across households. Next, as in sections 3.1 and 3.2, we separate the household structure variable into "exposure" ages. We refer to this as the "extensive margin" of exposure, referring to *whether* the child has lived in a skipped-generation household at different age ranges. This last exercise helps us identify when the exposure has the most impact on child outcomes. As done throughout the report, we separate our analysis into the rural and urban samples. Finally, we explore the "intensity" of exposure to skipped-generation household. We refer to this as the "intensive margin" of exposure and define this variable as the proportion of childhood years that an individual live in skipped-generation home, doing so one age at a time. For example, a 12 year-old whose home is skipped generation from age 6 – 12 will have an intensity of exposure of 0.5, or 6/12 years living in a skipped-generation home.

5.3.1 Results for Rural Households

Table 8A reports the results for the extensive margin exposure in the rural sample. The OLS results for exposure during ages 0 – 12 in column 2 shows a negative and significant association between skipped-generation home and years of schooling achieved, about 1.019 years fewer than those who never experience a skipped-generation household. Breaking down the exposure years into smaller year ranges in column 3 show that the sensitive ages are during early childhood at 0 – 5 years. Exposure during this period is associated with 1.716 fewer years of education, while exposure at age 6 and after has no effect on schooling

achievement. Further dividing the exposure years in column 4 reveals that within the ages of 0 – 5 years, being exposed to skipped generation households during ages 3 – 5 have the most significant negative association with schooling outcome, at about 0.99 years less schooling than non- skipped-generation peers. Controlling for various household variables associated with the household head, the coefficient falls slightly to -0.98, and significant at the 5% level

[Table 8A about here]

To see if the observed outcomes are related to the availability of financial resources, we add control variables for remittances received, remittances sent, household net per capita income, and household net business expense per capita during their childhood years (ages 0 – 12). It turns out that both net income and remittances received are negatively associated with schooling year achievements. A one-log point increase in net household income per capita is associated with about 3.62 fewer years of schooling, whereas a one-log point increase in remittances received is associated with 0.17 fewer years of education in the specification with detailed exposure ages.

Nevertheless, after controlling for cohort fixed effects, remittances are positively related to attained years of schooling, but the effect of 0.06 increased years of schooling per 1 log point increase in remittances is practically small. And confirming the previous OLS results, the specification that controls for cohort fixed effects show a negative and significant effect of exposure to skipped-generation household during ages 3 – 5. Being exposed at this age is associated with about 0.24 fewer years of schooling achieved.

We also explore the intensity of exposure to a skipped-generation household as a robustness check on our results. We define this variable as the number of years during an age range that the individual finds themselves in a skipped-generation household, divided by the total number of years in that age range. The results give us added confidence of the effect that household structure has on child outcomes. Table 8B reports the results on this analysis. Across the board we see negative associations between the intensity of exposure to a skipped-generation household. Most importantly, controlling for cohort fixed effects we see that a 1-unit higher intensity during ages 0 – 5 is associated with about 0.58 fewer years of schooling. Nevertheless, the effect becomes insignificant after breaking the exposure years down into finer details, probably having to do with individuals being exposed at different ages.

[Table 8.B about here]

5.3.2 Results for Urban Households

Among urban households we see that exposure to skipped-generation household at some point during one's childhood is associated with fewer years of schooling across the board. Table 9A reports the regression results for years of schooling outcome and exposure to skipped-generation household at various ages. Having lived in a skipped-generation home at all during the ages 0 – 12 lowers the individual's achieved years of schooling by about 1.59 years overall, before adding relevant control variables. Separating the exposure years into

finer detail, we can see that the negative association occurs for exposure during ages 0 – 5 years broadly speaking, and during ages 3 – 5 years to be precise. Exposure to a skipped-generation household at any time during the ages of 3 – 5 years reduces years of schooling by about 1.01 – 1.06 years, representing the effect before and after control variables are added, respectively.

[Table 9.A about here]

Household characteristic variables at first seem to be important explanations for the schooling outcome variation across household types, even though their estimated coefficients seem counterintuitive. However, this seeming importance disappears once we control for cohort fixed effects. Specifically, the estimated coefficients for our coefficients of interest, the exposure to skipped-generation household at various stages, change only a little when adding remittances and income variables, but the coefficient on remittances received are negative while that on business expenses is positive. This is the opposite of what one might expect because remittances increase available financial resources, while business expenses would decrease available financial resources. After controlling for cohort effects, however, the magnitude of these coefficients fall visibly and are either statistically or practically insignificant. In this specification, exposure to a skipped generation household during the ages of 3 – 5 goes hand in hand with about a 0.5 fewer years of schooling.

As with the rural sample, we alternatively estimate regression models using the intensive margin of skipped-generation household exposure during various ages as explanatory variables for our robustness check. Table 9B reports the results. It appears that the intensity of exposure does not matter as much as whether the individual experience a skipped-generation household at all. Under the OLS specification, with and without various control variables, we continue to see the negative effect of being exposed for a larger proportion of time during various age ranges. Specifically, spending a larger proportion of one's life in a skipped-generation home during the ages of 3 – 5 years is associated with fewer years of schooling, the magnitude ranging from 0.8 to 1.01 fewer years of schooling per one-unit increase in exposure intensity. This association greatly diminishes and is no longer significant at conventional levels when we control for cohort fixed effects, even though it remains quite close to significance.

[Table 9.B about here]

When viewed together, the results on education outcome, education spending, and remittances tell a story that is both revealing and somewhat alarming. While we conjectured that the ambiguity in our expected results would arise from the opposing forces of absent parents and high remittances determining children outcomes. Absent parents would lower children's achievements due to less resources invested in their outcomes, but on the other hand the absence is in exchange for a better financial outcome allowing for more resources to be invested in children. Our results show that financial remittances *are* higher in skipped-generation households, but these do not seem to be enough to compensate for parents' absence. In fact, most of our results point to skipped-generation households spending *less* on

education despite receiving higher remittances than non-skipped-generation households. This is more pronounced in rural households.

Given that these spending and remittance patterns eventually translate to children's outcome, one would reasonably worry about the long-term consequences for the children themselves, their families, as well as their communities. Our outcome of interest, which is years of education achieved, is well-known to be an important determinant of other important outcomes in the future, such as income and health (Currie, 2008). If household structure is important in determining pattern of investments in children and their educational outcomes, it seems appropriate that we give due attention to the phenomenon of parents leaving children behind for economic reasons.

Even though the patterns of the findings are similar in rural and urban households, we might pay more attention to this phenomenon in the rural area given its higher prevalence. As reported earlier in the paper, skipped-generation households make up about 9% of all households in the urban sample, whereas it accounts for about 16% of rural households. In addition, rural households tend to be less economically well-off and are likely experiencing a transition. Minor economic advancement at the price of gradual deterioration of the family structure may not be an exchange worth making in the long run.

6. Instrumental variables results

As a robustness analysis, we address potential endogeneity issue of migration decision. Individuals may self-select to migrate out of their local area. This has an implication on family types not being entirely exogenous. To account for this, we draw up a set of instruments that generate some exogenous variation on migration decision and henceforth the formation of skipped-generation household, but have no direct influence on the human capital formation of the child in questions. We consider variables that capture local economic conditions during the childhood ages. Availability of job opportunities in local factories reflects local economic opportunity, which may influence decisions of new parents whether or not to move away from home or stay intact with their offspring. In effect, this impacts the incidence as well as the duration of parental presence at home, for a given child at a given age profile. Night lights from satellite also capture the overall local economic growth (Henderson et al 2012). All local variables used for our instruments are at district-level, specifically for a given age of the children in the survey.

We construct the set of variables on new factories from the administrative data of Thailand's Ministry of Industry (Department of Factory). We use factory license number to derive the year at which a factory is established and its location of operation. This allows us to obtain the year-on-year inflow of new factories at each district level from 1945 up to date[4].

[4] We initially considered using information of outflow of factories from local area. The Ministry of Industry also keeps the database of factory closure. Unfortunately, the data only started in 2004 therefore it is not suitable to apply to our birth cohorts.

We also obtain factory-level variables on investment capital, size of workforce and horsepower capacity. We convert these variables into year-on-year district-level (standardised log value). For night lights data, we construct district-level nightlight index (standardised) from the U.S National Oceanic and Atmospheric Administration (NOAA) from 1993-2013. Because the Agency has not release the data from 2014 and 2015, therefore for these years' index, we apply a linear projection (within district) from two years preceding.

We run the two-stage least square analysis only for the Townsend Rural Annual Survey. Table 10 shows the estimation results from the 2SLS, using the binary definition of family type (whether or not ever grown up in a skipped-generation household during a given age period). First-stage regressions (columns II, III, V, and VI) show the relationship between being a skipped-generation household and a set of local economic conditions (inflow of new factories in the district of residence and standardised night light index). There is strong and negative relationship between night lights and the probability of being a skipped-generation household. This suggests the positive correlation between economic development and parental decisions *not* to migrate out of their local area. For factory variables, the patterns are not as clear. Nevertheless, we observe that high volume of investment finance *increases* the probability of being a skipped-generation family. In contrast, larger size of factory workforce is associated to a smaller probability of being a skipped-generation household. All in all, our instrument variables are not statistically powerful in explaining the variation of family type (small F-statistics reported at the bottom of the table). Unfortunately, we run a risk of violating the Instrumental Variable's Relevant Assumption required for a sound 2SLS analysis.

As a reference to the readers, we report our 2SLS in columns I and IV of Table 10 (as well as Columns I and IV in Table 11), using the final specifications in our fixed-effect analysis previously. With instrumental variables, we find negative relationship of early-age growing up in a skipped generation family on years of schooling. Focussing on Column 4, the net effect of growing up in a skipped family from our 2SLS is 4 years of schooling, approximately. This is larger than the fixed effect estimates reported in the previous section. This is evidence that our OLS estimates suffer from issues of omitted variable biases (unobserved preferences for migration). However, because of the issue of weak instruments we reported earlier, we are cautious in interpreting our 2SLS findings as true, unbiased estimates of the effect of skipped-generation family on schooling. However, we urge the readers to refer to the estimates from the 2SLS as the upper-bound effect and the fixed effect as the lower-bound.

7. Conclusions and Final Remarks

From our OLS, fixed-effect and 2SLS estimations, we find strong evidence that children growing up in a skipped-generation household faced disadvantages relative to their peers, both in terms of lower of education spending as well as lower years of schooling. This negative effect is not just contemporaneous. We also show that a short duration of living in a

skipped generation household poses a long-shadow effect, at least up to young adulthood. And that the magnitude of the effect is strongest when the exposure occurs during the early life, in particular during 3-5 years old.

Conventional beliefs may argue in favour of higher income, especially from remittances sent back from parents who had gone to seek employment elsewhere, which may be more than sufficient to compensate the negative effect of the lack of parental presence in the household. Indeed, we find that for both the rural and urban households in Townsend Annual Survey, the households with young parents working elsewhere receive higher remittances than other families on average. Unfortunately, our results reveals that there is no such compensatory effect from higher remittances, both for the rural children and the urban children, on schooling outcomes. Skipped-generation households, whilst receiving higher remittances, are found to spend less on education expenses than their counterparts.

Our analysis also finds negative association of remittances and years of schooling. This does not, however, indicate that remittance reduces educational achievement. A more appropriate association to draw from our results is that between parental absence and child outcome. There are unobserved factors that might correlate with parental absence, such as time investments, carer-child interactions and family activities. Higher remittances are associated to longer absence of parents, and this may lead to the negative association found in our analysis.

Overall, our study is not without limitations. First of all, throughout the study, we use highest years of education as our main proxy for human capital development. We acknowledge that alternative measures, namely specific abilities and skills (cognitive and non-cognitive), health status, psychological conditions and wellbeing, should be incorporated to complement our conclusion. With the data currently available in our dataset, we are unable to test the potential effects of being exposed to a skipped generation family in other dimensions.

Second, since our key variable of family structure is not derived from an experimental setting (true experiment or quasi-experimental), our analysis of the effect of skipped generation is not able to make a *within-individual* comparison between the true outcome and the *counterfactual* outcome. Specifically, children living in skipped generation could have been much worse off in their human capital accumulation had their parents decided to remain in the area. Therefore, this selection problem can bias our estimated effect of skipped generation exposure *upward* from the true effect. Our empirical design of instrumental variables, using the factory density, attempted to best account for the biased. Yet, we urge our readers to interpret our estimations with cautious in this regard.

One might draw some policy recommendations from our research. First, our findings raise caution on economic development policy. Local income generating activities allow young workforce to stay closer to their immediate families. The lack of job opportunity in local areas only pushes them to stay away. Policies that neglect family ties may have detrimental effects in the long run. The present government initiative of Special Economic

Zones could work in favour of reducing the incidence of skipped-generation households, but if not evenly targeted it will still encourage out-migration and form further skipped-generation households. Furthermore, without proper childcare initiatives in place, for example compulsory on-site day care centres at industrial parks, it is unlikely that young parents would bring their children to care at their work locations. Parents may still be required to separate themselves from their children for work.

Second, government policy to induce higher fertility should also take into account how to best guarantee higher quality of human capital at the same time. As our findings suggest, children growing up in disadvantageous conditions suffer not only a short-term effect but longer-term effect on their human capital development. A loss of almost 2 years of schooling is equivalent to a substantial reduction of income at approximately 12 % per year in Thailand (see Warunsiri and McNown 2010, Tangtipongkul 2015 for recent analysis on Thailand's returns to schooling). Because we are able to track our birth-cohorts in the Townsend Data only up to their early entry to the labour force, we are unable to draw any analytical conclusions on potential adverse effect of growing up in skipped-generation households on their long-term outcomes. We would also be concerned on negative effects of parental absence on other dimensions, particularly social skills, physical health and socio-psychological wellbeing. A future application of more extended longitudinal data would enable us to do so. Nevertheless, research from the literature has already presented the robust causality between schooling achievement and a plethora of long-term outcomes, namely labour market success, physical health, family life or even life expectancy (see for example Oreopoulos and Salvanes 2011, Powdthavee, Lekfuangfu, and Wooden 2015).

Our research finds that absent parents solely providing financial support via remittances does not guarantee education spending on their children and their schooling outcomes that are on par with parents who are present in the household. We fully understand that for many households, parents make a tough choice in leaving their children behind in search of work. In most cases, however, the tough choice is made in favour of higher incomes. The findings provided here suggest that this choice may not be optimal once we consider the long run.

In term of policy intervention, our findings on remittances suggest that public assistance to disadvantaged households should not arrive only in the form of financial support. Preferred interventions to improve the condition of skipped-generation household should come in the form of parenting knowledge intervention. Research has shown that younger, more education parents are better at adopting new technologies. Grandparents caring for grandchildren would benefit more from interventions that, for example, provide information, home visits, or informal training on how to best care for their young members.

REFERENCES

Adams Jr, R. H., & Cuecuecha, A. (2010). Remittances, household expenditure and investment in Guatemala. World Development, 38(11), 1626-1641.

Aizer, A., Stroud, L., & Buka, S. (2015). Maternal stress and child outcomes: Evidence from siblings. *Journal of Human Resources*.

Bartik, T. J. (1991). Who benefits from state and local economic development policies?.

Becker, G. S., & Tomes, N. (1976). Child endowments and the quantity and quality of children. Journal of political Economy, 84(4, Part 2), S143-S162.

Becker, G. S., & Tomes, N. (1976). Child endowments and the quantity and quality of children. *Journal of political Economy*, *84*(4, Part 2), S143-S162.

Blundell, R., Chiappori, P. A., & Meghir, C. (2005). Collective labor supply with children. *Journal of political Economy*, *113*(6), 1277-1306.

Brown, R. P., & Ahlburg, D. A. (1999). Remittances in the South Pacific. *International Journal of Social Economics*, 26(1/2/3), 325-344.

Bryan, G., Chowdhury, S., & Mobarak, A. M. (2014). Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh. *Econometrica*, 82(5), 1671-1748.

Chiappori, P. A. (1988). Rational household labor supply. Econometrica: Journal of the Econometric Society, 63-90.

Chiappori, P. A. (1992). Collective labor supply and welfare. Journal of political Economy, 100(3), 437-467.

Cunha, F. (2015). Subjective rationality, parenting styles, and investments in children. In Families in an Era of Increasing Inequality (pp. 83-94). Springer International Publishing.

Cunha, F., Elo, I., & Culhane, J. (2013). Eliciting Maternal Expectations about the Technology of Cognitive Skill Formation (No. w19144). National Bureau of Economic Research.

Currie, J. (2009). Healthy, wealthy, and wise: Socioeconomic status, poor health in childhood, and human capital development. *Journal of Economic Literature*, *47*(1), 87-122.

Durand, J., Kandel, W., Parrado, E. A., & Massey, D. S. (1996). International migration and development in Mexican communities. *Demography*, 33(2), 249-264.

Edwards, A. C., & Ureta, M. (2003). International migration, remittances, and schooling: evidence from El Salvador. *Journal of development economics*, 72(2), 429-461.

Felkner, J. S., & Townsend, R. M. (2011). The geographic concentration of enterprise in developing countries. The quarterly journal of economics, 126(4), 2005-2061.

Fitzsimons, E., Malde, B., Mesnard, A., & Vera-Hernández, M. (2012). Household responses to information on child nutrition: experimental evidence from Malawi.

Henderson, J. V., Storeygard, A., & Weil, D. N. (2012). Measuring economic growth from outer space. *American economic review*, *102*(2), 994-1028.

Maccini, S., & Yang, D. (2009). Under the Weather: Health, Schooling, and Economic Consequences of Early-Life Rainfall. American Economic Review, 99(3), 1006-26

Mestieri, M., Schauer, J., & Townsend, R. M. (2017). Human capital acquisition and occupational choice: Implications for economic development. *Review of Economic Dynamics*, *25*, 151-186.

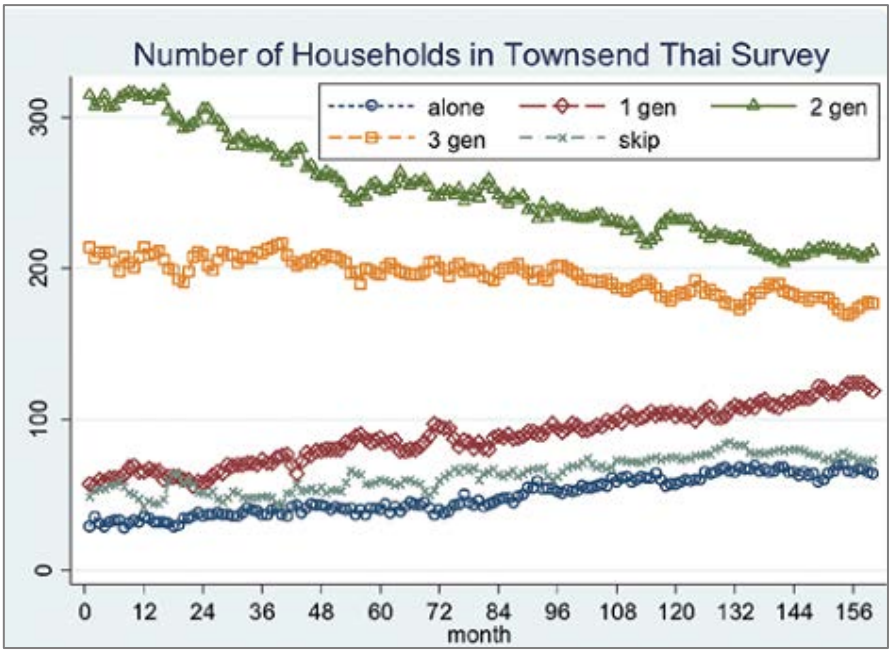
Oreopoulos, P., & Salvanes, K. G. (2011). Priceless: The nonpecuniary benefits of schooling. *Journal of Economic perspectives*, *25*(1), 159-84.

Powdthavee, N., Lekfuangfu, W. N., & Wooden, M. (2015). What's the good of education on our overall quality of life? A simultaneous equation model of education and life satisfaction for Australia. *Journal of behavioral and experimental economics*, *54*, 10-21.

Tangtipongkul, K. (2015). Rates of return to schooling in Thailand. *Asian Development Review*, *32*(2), 38-64.
Warunsiri, S., & McNown, R. (2010). The returns to education in Thailand: A pseudo-panel approach. *World Development*, *38*(11), 1616-1625.
Yang, D. (2011). Migrant remittances. *Journal of Economic perspectives*, 25(3), 129-52.

FIGURES

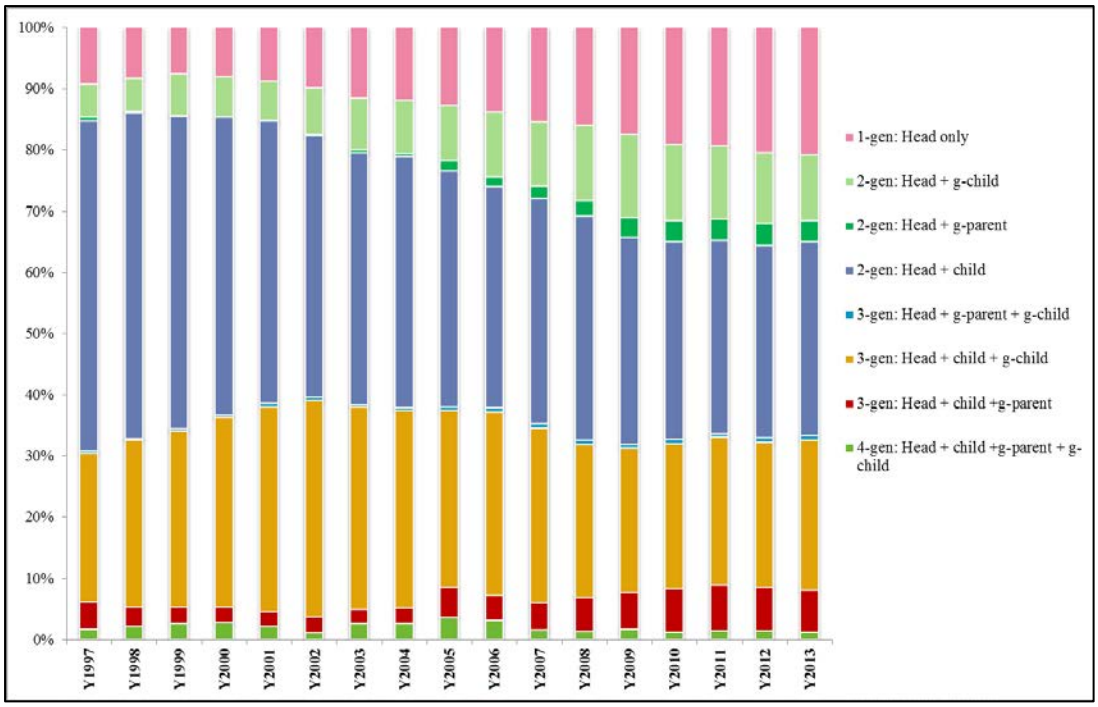
Figure 1: Number of households in Townsend Monthly Rural Survey



Source: calculated from the Townsend Monthly Sample, A. Pawasutipaisan (2016)

Figure 2: Household structures across survey waves

2.A. Rural Annual Sample



2.B. Urban Annual Sample

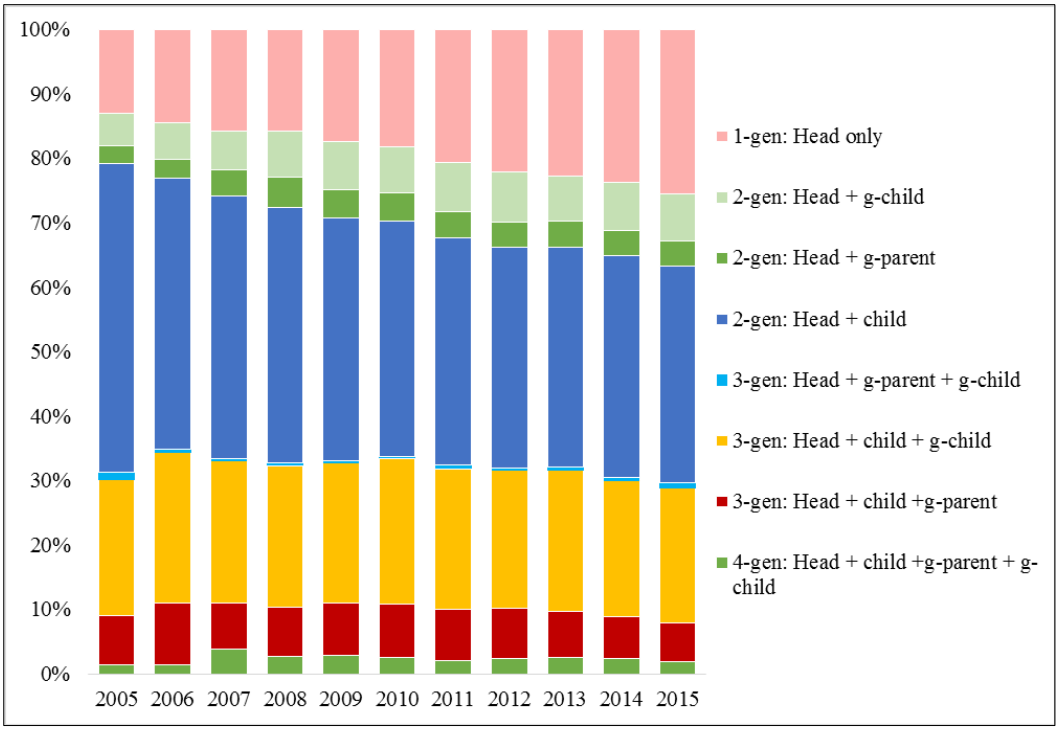


Figure 3. Percentage of skipped-generation households (conditional on households with young members)

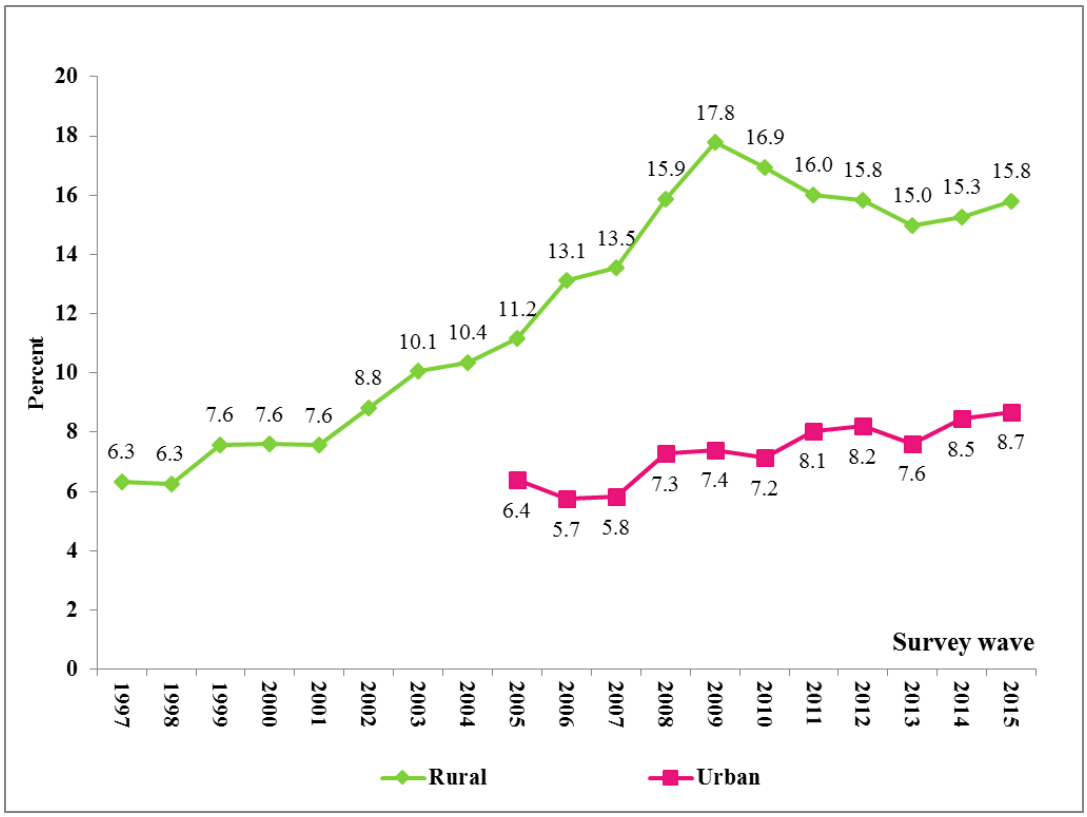


Figure 4. Percentage of children growing up in a skipped-generation, along the ages

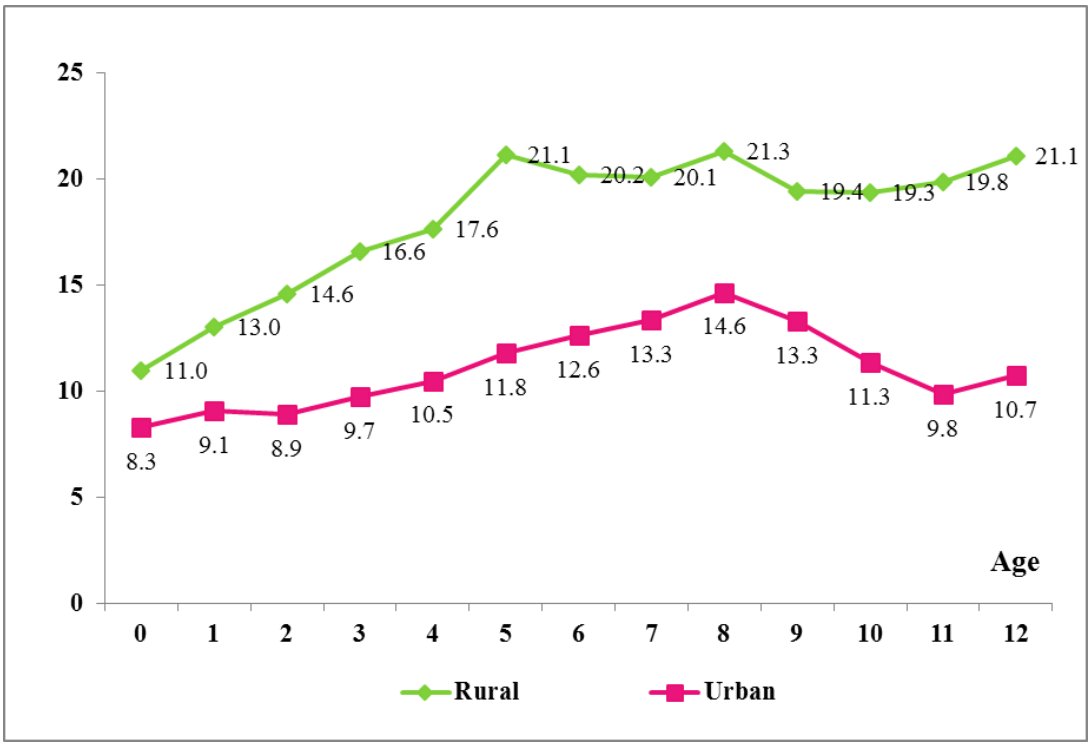
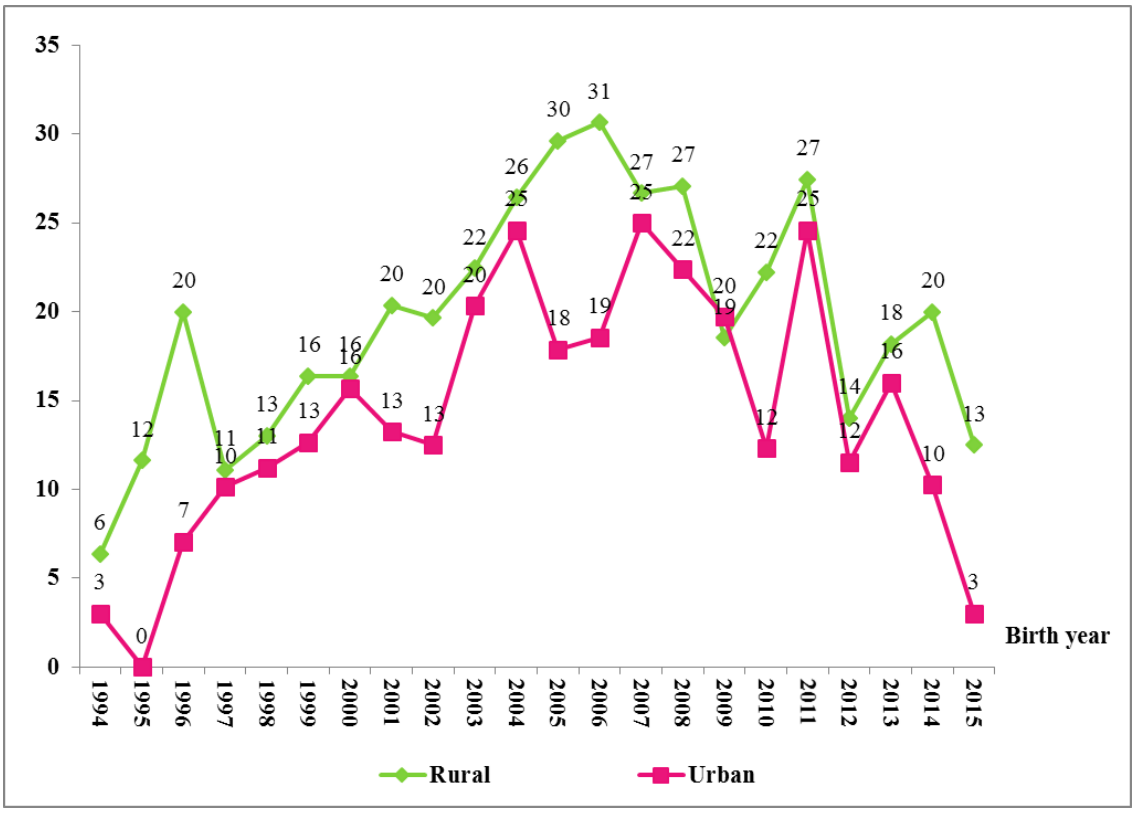


Figure 5. Proportion of children ever grown up in a skipped-generation household (%)



TABLES

Table 1

	Total children and youth	Percentage		
		Live with own parents	No living with own parents	Living with grandparents
Total	17,422,291	61.8	20.1	14.88
Age group				
0 - 4	4,566,922	63.6	19.7	16.81
5 - 9	4,590,979	61.1	21.9	17.83
10 - 14	5,116,341	60.8	19.5	14.23
15 - 17	3,148,049	62.1	19.0	8.85
Gender				
Male	8,907,141	62.5	19.8	14.96
Female	8,515,151	61.2	20.4	14.80
Area				
Municipal	5,077,475	64.6	16.5	9.86
Rural	12,344,816	60.7	21.6	16.95
Region				
Bangkok	1,494,411	70.5	11.9	5.11
Central	3,878,106	64.2	17.7	11.86
North	2,923,953	57.2	22.8	16.80
Northeast	6,385,863	54.8	26.0	21.31
South	2,739,959	75.1	11.4	7.45

Source: the 2006 National Children and Adolescence Survey, authors' calculation

Table 2. Number of young children by their relationship to household head

Panel A. Rural Annual Sample, by wave

	Offspring			Grandchild		
	New born	**Aged 1-5**	**Aged 6-12**	**New born**	**Aged 1-5**	**Aged 6-12**
1997	0	184	399	0	262	196
1998	6	162	381	22	253	211
1999	13	139	360	36	249	229
2000	8	117	311	29	267	250
2001	6	91	295	33	250	263
2002	5	81	277	32	255	280
2003	6	72	252	27	240	286
2004	6	82	279	33	269	322
2005	15	98	312	29	299	357
2006	10	82	258	28	279	317
2007	8	76	257	42	270	310
2008	5	72	237	44	272	296
2009	7	76	214	19	272	294
2010	10	73	210	29	235	280
2011	4	72	191	24	236	283
2012	7	66	182	25	207	291
2013	3	54	178	26	200	291
2014	0	43	159	16	192	295
2015	5	38	150	25	179	294

Panel B. Urban Annual Sample, by wave

	Offspring			Grandchild		
	Newborn	**Aged 1-5**	**Aged 6-12**	**Newborn**	**Aged 1-5**	**Aged 6-12**
2005	4	136	408	14	233	294
2006	10	126	364	17	247	309
2007	11	124	327	29	236	286
2008	9	113	306	33	229	276
2009	12	109	285	35	235	270
2010	6	104	256	26	233	268
2011	6	92	213	21	211	270
2012	4	78	187	27	205	276
2013	3	65	171	22	197	276
2014	4	51	161	22	193	270
2015	12	34	162	14	180	278

Table 3.A. Summary statistics by household types

	Rural HH			Urban HH		
	3 Gen	**2 Gen**	**Skipped**	**3 Gen**	**2 Gen**	**Skipped**
Household size	5.66	4.09	3.54	6.41	4.50	3.92
Num. members age under 5 yrs	0.78	0.20	0.41	0.73	0.21	0.37
Num. own children	1.57	1.96	N/A	1.85	1.99	N/A
Num. own children under 5 yrs	0.02	0.19	N/A	0.02	0.18	N/A
Num. grand children under 5 yrs	0.75	N/A	0.39	0.69	N/A	0.31
Num. members age 60+	0.84	0.41	0.99	0.91	0.53	1.05
Num. members age under 15	1.76	1.03	1.37	1.79	0.96	1.43
Num. members ages 16-25	0.81	0.78	0.31	0.90	0.86	0.40
Num. members ages 26-45	1.44	1.24	0.19	1.83	1.30	0.23
Average age of members live elsewhere	33.72	28.01	34.35	34.67	29.98	35.54
Num. members live elsewhere	2.64	1.15	3.64	0.53	1.27	0.11
Log of hh gross income	11.94	11.80	11.41	12.90	12.69	12.24
Log of hh net income	11.58	11.43	11.18	12.52	12.26	11.93
Log of hh gross income per capital	10.29	10.52	10.24	11.08	11.24	10.94
Log of hh net income per capital	9.95	10.15	10.01	10.71	10.81	10.63
Log of hh business expenses per capita	7.43	7.65	5.96	7.30	7.37	5.85
Log of remittances received	5.62	2.55	8.63	6.06	4.14	9.26
Log of remittances sent	0.57	1.12	0.39	1.16	4.28	0.31
Whether hh has a business (%)	42.69	42.40	30.50	65.40	61.11	46.15
Num of businesses	0.59	0.57	0.37	0.90	0.84	0.62
Whether hh head is female (%)	35.19	26.90	37.67	38.10	35.95	49.64
Average age of hh head	60.85	48.17	62.57	59.04	48.70	61.40
HH head with primary school or below (%)	22.61	17.19	22.42	10.04	5.30	8.52
HH head with middle school qual. (%)	71.89	66.15	73.55	62.88	45.56	66.45
HH head with high school qual. (%)	2.87	8.45	2.53	12.11	21.33	11.42
HH head with college qual. (%)	2.18	5.28	1.28	10.74	19.40	10.76

Table 3. B. Summary statistics by household types (household expenditure)

	Rural HH			Urban HH		
	3 Gen	**2 Gen**	**Skipped**	**3 Gen**	**2 Gen**	**Skipped**
Log of expenditure						
On education	6.78	6.07	6.75	8	6.77	7.64
	[3.5]	[4.2]	[3.5]	[3.47]	[4.40]	[3.55]
On clothing	6.86	6.88	6.25	7.85	7.71	7.29
	[2.03]	[2.1]	[2.3]	[1.24]	[1.31]	[1.59]
On food (out of pocket)	7.09	7	7	8.71	8.41	8.43
	[2.5]	[2.6]	[2.5]	[1.89]	[2.07]	[2.11]
On repair	5.54	5.58	4.18	7.22	7.07	5.7
	[3.2]	[3.2]	[3.4]	[1.85]	[1.96]	[2.93]
Ratio to total expenditure						
On education	38.33	37.74	43.81	39.01	37.31	40.6
	[28.6]	[31.8]	[30.2]	[26.15]	[29.99]	[27.48]
On clothing	19.18	19.59	16.17	14.58	15.85	13
	[17.7]	[18.4]	[16.4]	[12.48]	[14.30]	[12.56]
On food (out of pocket)	28.19	28.09	31.49	35.22	34.75	38.21
	[24.07]	[25.6]	[26.3]	[24.92]	[26.62]	[26.57]
On repair	14.46	14.63	8.59	11.46	12.41	8.31
	[18.7]	[19.2]	[14.7]	[13.62]	[14.85]	[12.41]

Notes: Summary statistics shown here are mean and standard deviation of overall values (pooled data of rural survey 1997-2015; pooled data of the Urban Survey 2005-2015.

Table 4. Education Spending and Household Structures—Rural Sample

Exposure at	age0-5	age0-5 FE	age6-9	age6-9 FE	age10-12	age10-12 FE	age0-12	age0-12 FE
Age 0-2	-0.036	-0.066	0.254	0.132	0.214	0.042	-0.083	-0.133
	[0.424]	[0.465]	[0.259]	[0.285]	[0.219]	[0.226]	[0.344]	[0.345]
Age 3-5	-1.261*	-1.252*	-0.211	-0.118	0.524**	0.370*	-0.224	-0.302
	[0.511]	[0.545]	[0.116]	[0.142]	[0.139]	[0.160]	[0.622]	[0.675]
Age 6-9			0.228	0.413***	0.023	0.067	-0.106	-0.013
			[0.120]	[0.064]	[0.303]	[0.250]	[0.326]	[0.377]
Age 10-12					0.061	0.241	-1.018*	-1.062*
					[0.310]	[0.350]	[0.418]	[0.417]
Log of remittance received (0-5)	0.006	-0.012	0.056**	0.036				
	[0.027]	[0.019]	[0.015]	[0.026]				
Log of remittance received (6-9)			0.017	0.014				
			[0.018]	[0.017]				
Log of remittance received (0-12)					0.017	-0.004	0.017	-0.004
					[0.012]	[0.015]	[0.012]	[0.015]
Log of remittance sent (0-5)	0.234*	0.199	0.044	0.018				
	[0.112]	[0.117]	[0.030]	[0.033]				
Log of remittance sent (6-9)			0.027	0.026				
			[0.031]	[0.028]				
Log of remittance sent (0-12)					0.247	0.232	0.247	0.232
					[0.164]	[0.147]	[0.164]	[0.147]
Whether planned to give inheritance	-0.427	-0.437	-0.188	-0.208	-0.521**	-0.502**	-0.271	-0.363
	[0.258]	[0.220]	[0.123]	[0.155]	[0.154]	[0.157]	[0.167]	[0.201]
Num members lived outside	-0.093*	-0.069	-0.133**	-0.085**	-0.116	-0.069	-0.045	0
	[0.037]	[0.051]	[0.033]	[0.025]	[0.096]	[0.109]	[0.037]	[0.046]
Mean age of members lived outside	0.036	0.022	0.020*	0.009	0.019**	0.013***	0.050**	0.038
	[0.026]	[0.033]	[0.009]	[0.005]	[0.006]	[0.003]	[0.016]	[0.022]
Household size	-0.342	-0.362	-0.055	-0.042	0.158*	0.138	-0.129	-0.127
	[0.176]	[0.195]	[0.120]	[0.110]	[0.067]	[0.098]	[0.181]	[0.197]
Num. children under 15 years old	1.886***	1.888***	0.611**	0.590***	0.131	0.167	1.098**	1.096**
	[0.190]	[0.223]	[0.203]	[0.143]	[0.178]	[0.208]	[0.279]	[0.275]
Number of family businesses	0.590***	0.628***	0.151	0.168	0.218	0.219*	0.274*	0.312**
	[0.134]	[0.131]	[0.111]	[0.086]	[0.141]	[0.102]	[0.124]	[0.119]
Observations	612	612	419	419	319	319	385	385
Adjusted R-squared	0.238	0.265	0.193	0.257	0.124	0.198	0.207	0.223

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 5. Education Spending and Household Structures—Urban Sample

Exposure at	age0-5	age0-5 FE	age6-9	age6-9 FE	age10-12	age10-12 FE	age0-12	age0-12 FE
Age 0-2	0.87	0.776	-0.711	-0.72	-0.146	-0.184	-0.419	-0.361
	[0.776]	[0.759]	[0.993]	[0.827]	[0.237]	[0.255]	[1.247]	[1.194]
Age 3-5	-1.886**	-1.626*	-0.136	-0.329	0.583*	0.588	-0.195	-0.176
	[0.587]	[0.637]	[1.124]	[1.074]	[0.284]	[0.294]	[0.926]	[0.917]
Age 6-9			-0.785	-0.955	0.117	0.105	-0.526	-0.543
			[0.538]	[0.569]	[0.180]	[0.141]	[0.683]	[0.726]
Age 10-12					1.426***	1.457***	-1.789*	-1.72
					[0.193]	[0.278]	[0.885]	[0.869]
Log of remittance received (0-5)	0.054	0.05	-0.035	-0.051				
	[0.103]	[0.097]	[0.027]	[0.030]				
Log of remittance received (6-9)			0.037*	0.037*				
			[0.017]	[0.015]				
Log of remittance received (0-12)					-0.030*	-0.029	0.078	0.071
					[0.014]	[0.017]	[0.056]	[0.055]
Log of remittance sent (0-5)	0.012	0.001	0.129	0.186				
	[0.172]	[0.178]	[0.103]	[0.123]				
Log of remittance sent (6-9)			-0.018	0.003				
			[0.092]	[0.087]				
Log of remittance sent (0-12)					-0.154***	-0.156**	0.227***	0.243***
					[0.025]	[0.043]	[0.039]	[0.053]
Whether planned to give inheritance	-0.55	-0.507	-0.056	-0.079	-0.213	-0.212	-0.205	-0.194
	[0.432]	[0.398]	[0.382]	[0.431]	[0.385]	[0.403]	[0.572]	[0.621]
Num members lived outside	0.115	0.128	-0.189	-0.319	0.245*	0.25	-0.258	-0.308
	[0.218]	[0.234]	[0.164]	[0.230]	[0.120]	[0.153]	[0.179]	[0.157]
Mean age of members lived outside	0.023	0.024	0.044	0.053	0.008	0.006	0.058	0.06
	[0.040]	[0.043]	[0.044]	[0.042]	[0.026]	[0.029]	[0.043]	[0.043]
Household size	0.045	0.066	-0.226*	-0.268**	-0.233**	-0.234**	-0.139	-0.16
	[0.174]	[0.198]	[0.100]	[0.082]	[0.071]	[0.072]	[0.167]	[0.160]
Num. children under 15 years old	1.413***	1.388***	0.995***	0.915***	0.584**	0.604**	1.254**	1.295**
	[0.280]	[0.298]	[0.222]	[0.131]	[0.147]	[0.179]	[0.354]	[0.325]
Number of family businesses	0.083	0.104	0.682	0.717	0.056	0.095	-0.403	-0.372
	[0.572]	[0.575]	[0.671]	[0.564]	[0.210]	[0.221]	[0.529]	[0.533]
Observations	230	230	119	119	79	79	99	99
Adjusted R-squared	0.212	0.21	0.11	0.186	0.29	0.231	0.219	0.184

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 6. Household structure and remittances received: rural sample

Exposure at	age0-12	age0-12	age0-12	age0-12 FE
Age 0-12	1.648***			
	[0.229]			
Age 0-5		0.808***		
		[0.171]		
Age 6-12		1.478***		
		[0.279]		
Age 0-2			0.658	0.628
			[0.476]	[0.419]
Age 3-5			-0.188	-0.297*
			[0.143]	[0.125]
Age 6-9			2.620***	2.560***
			[0.435]	[0.376]
Age 10-12			-0.322	-0.237
			[0.588]	[0.548]
Female	0.236	0.234	0.153	0.106
	[0.348]	[0.431]	[0.478]	[0.532]
Age of head	0.101***	0.106***	0.090***	0.089***
	[0.011]	[0.006]	[0.015]	[0.009]
Whether planned to give inheritance	-0.221	0.063	0.131	0.068
	[0.433]	[0.452]	[0.294]	[0.271]
Num members lived outside	0.759***	0.872***	0.832***	0.847***
	[0.043]	[0.096]	[0.087]	[0.069]
Mean age of members lived outside	-0.039	-0.072**	-0.087***	-0.094**
	[0.034]	[0.023]	[0.019]	[0.030]
Household size	-0.778***	-0.549***	-0.245	-0.236
	[0.045]	[0.083]	[0.241]	[0.265]
Num. children under 15 years old	1.188***	0.800***	0.297	0.225
	[0.156]	[0.147]	[0.356]	[0.378]
Number of family businesses	0.259	0.21	0	0.039
	[0.352]	[0.324]	[0.210]	[0.190]
Log of net HH income per capital (0-12)	0.538*	0.357	0.213	-0.274
	[0.211]	[0.210]	[0.284]	[0.361]
Log of HH business exp per capital (0-12)	-0.057	-0.058	-0.071**	-0.040*
	[0.040]	[0.059]	[0.022]	[0.017]
Constant	-5.052	-3.862	-0.384	4.639
	[2.532]	[2.920]	[4.562]	[5.214]
Observations	872	624	398	398
Adjusted R-squared	0.435	0.486	0.503	0.513

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 7. Household structure and remittances received: urban sample

Exposure at	age0-12	age0-12	age0-12	age0-12 FE
Age 0-12	2.212***			
	[0.457]			
Age 0-5		1.756*		
		[0.710]		
Age 6-12		1.367		
		[0.757]		
Age 0-2			-0.961	-0.879
			[0.929]	[0.910]
Age 3-5			2.903*	2.958*
			[1.254]	[1.175]
Age 6-9			1.795	1.891
			[1.145]	[1.040]
Age 10-12			1.048	1.28
			[1.555]	[1.176]
Female	-0.096	-0.032	0.295	0.514
	[0.140]	[0.054]	[0.510]	[0.996]
Age of head	0.126**	0.119**	0.207***	0.181**
	[0.032]	[0.043]	[0.031]	[0.053]
Whether planned to give inheritance	-1.205**	-0.587	-1.223**	-1.064
	[0.357]	[0.471]	[0.385]	[0.535]
Num members lived outside	-0.153	-0.304**	-0.215	-0.292
	[0.096]	[0.102]	[0.197]	[0.154]
Mean age of members lived outside	0.019	-0.011	-0.05	-0.035
	[0.036]	[0.042]	[0.069]	[0.080]
Household size	-0.593***	-0.330**	-0.09	-0.101
	[0.100]	[0.128]	[0.462]	[0.481]
Num. children under 15 years old	1.255**	0.648	0.057	-0.013
	[0.351]	[0.457]	[1.168]	[1.276]
Number of family businesses	-0.713	-1.122	-2.199**	-2.073
	[0.556]	[0.737]	[0.671]	[1.062]
Log of net HH income per capital (0-12)	0.617	1.042	-0.286	-0.432
	[0.537]	[0.859]	[1.119]	[0.956]
Log of HH business exp per capital (0-12)	-0.047	-0.046	0.113*	0.081
	[0.093]	[0.107]	[0.049]	[0.126]
Constant	-7.121	-10.339	0.335	1.634
	[5.528]	[8.902]	[12.516]	[11.962]
Observations	628	350	102	102
Adjusted R-squared	0.31	0.293	0.317	0.319

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, and an indicator variable equal to 1 if household works in agriculture.

Table 8A. Household structure and Achieved Years of Schooling—Extensive Margin, Rural Sample

Exposure (at all) at	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
Age 0-12	-1.019*								
	[0.437]								
Age 0-5		-1.716**		-1.665**		-0.857		-0.187	
		[0.568]		[0.509]		[0.437]		[0.227]	
Age 6-12		0.338	0.72	0.5	0.649	0.821	1.047*	-0.053	0.07
		[0.606]	[0.475]	[0.755]	[0.568]	[0.676]	[0.466]	[0.230]	[0.231]
Age 0-2			-1.094		-1.299*		-0.710*		-0.263
			[0.618]		[0.572]		[0.333]		[0.161]
Age 3-5			-0.988**		-0.975**		-0.637		-0.235*
			[0.320]		[0.367]		[0.448]		[0.103]
Log of remittance received (0-12)						-0.220**	-0.172*	0.047*	0.056*
						[0.066]	[0.085]	[0.019]	[0.024]
Log of remittance sent (0-12)						0.15	-0.057	0.065**	0.046
						[0.259]	[0.184]	[0.022]	[0.026]
Log of net HH income per capital (0-12)						-3.524***	-3.619***	0.043	0.169
						[0.424]	[0.486]	[0.140]	[0.181]
Log of HH business exp per capital (0-12)						0.215**	0.194	0.02	0.014
						[0.078]	[0.104]	[0.030]	[0.028]
Female				0.142	0.066	0.302**	0.119	0.346***	0.407***
				[0.246]	[0.318]	[0.106]	[0.198]	[0.059]	[0.077]
Whether planned to give inherent				0.649*	0.637**	0.297	0.099	-0.039	0.041
				[0.303]	[0.238]	[0.228]	[0.233]	[0.149]	[0.106]
Num members lived outside				0.362*	0.452**	0.167	0.191	0.028	0.036
				[0.151]	[0.119]	[0.175]	[0.141]	[0.052]	[0.056]
Mean age of members lived outside				-0.048	-0.055	-0.066	-0.086	0.017	0
				[0.078]	[0.069]	[0.077]	[0.068]	[0.020]	[0.016]
Household size				0.32	0.232	0.278**	0.395*	0.087	0.144
				[0.180]	[0.144]	[0.108]	[0.179]	[0.111]	[0.104]
Num. children under 15 years old				-0.214	0.038	-0.790**	-0.841*	-0.063	-0.109
				[0.257]	[0.390]	[0.253]	[0.391]	[0.103]	[0.102]
Number of family businesses				0.185	0.161	0.566*	0.541*	0.052	0.006
				[0.456]	[0.438]	[0.229]	[0.248]	[0.145]	[0.132]
Observations	1,009	752	608	624	528	624	528	624	528
Adjusted R-squared	0.009	0.018	0.014	0.031	0.044	0.316	0.326	0.849	0.855

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 8B. Household structure and Achieved Years of Schooling—Intensive Margin, Rural Sample

Exposure Intensity at	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
Age 0-12	-1.801**								
	[0.698]								
Age 0-5		-1.693*		-2.033***		-1.277***		-0.582***	
		[0.659]		[0.469]		[0.143]		[0.134]	
Age 6-12		-0.44	-0.167	-0.018	0.071	0.878	0.960*	0.086	0.183
		[0.645]	[0.434]	[0.878]	[0.531]	[0.585]	[0.378]	[0.186]	[0.204]
Age 0-2			-1.169		-1.523*		-0.871**		-0.422
			[0.831]		[0.753]		[0.333]		[0.248]
Age 3-5			-0.656		-1.062*		-0.753		-0.303
			[0.374]		[0.467]		[0.395]		[0.165]
Log of remittance received (0-12)						-0.215**	-0.164	0.049**	0.055*
						[0.063]	[0.086]	[0.018]	[0.024]
Log of remittance sent (0-12)						0.154	-0.049	0.063**	0.046
						[0.263]	[0.182]	[0.021]	[0.025]
Log of net HH income per capital (0-12)						-3.543***	-3.620***	0.044	0.167
						[0.436]	[0.494]	[0.142]	[0.188]
Log of HH business exp per capital (0-12)						0.220**	0.192	0.02	0.013
						[0.076]	[0.102]	[0.029]	[0.028]
Female				0.173	0.053	0.320**	0.112	0.358***	0.407***
				[0.237]	[0.299]	[0.112]	[0.204]	[0.063]	[0.080]
Whether planned to give inherent				0.67	0.630**	0.316	0.107	-0.04	0.048
				[0.340]	[0.235]	[0.255]	[0.235]	[0.143]	[0.104]
Num members lived outside				0.368*	0.466**	0.165	0.192	0.027	0.033
				[0.158]	[0.121]	[0.183]	[0.150]	[0.053]	[0.057]
Mean age of members lived outside				-0.045	-0.053	-0.062	-0.082	0.02	0.002
				[0.076]	[0.066]	[0.077]	[0.067]	[0.020]	[0.015]
Household size				0.235	0.144	0.241*	0.357	0.063	0.141
				[0.195]	[0.124]	[0.119]	[0.181]	[0.124]	[0.105]
Num. children under 15 years old				-0.086	0.145	-0.733**	-0.795	-0.022	-0.096
				[0.289]	[0.370]	[0.279]	[0.402]	[0.115]	[0.094]
Number of family businesses				0.197	0.166	0.569*	0.549*	0.059	0.013
				[0.456]	[0.444]	[0.227]	[0.242]	[0.153]	[0.129]
Observations	1,009	752	608	624	528	624	528	624	528
Adjusted R-squared	0.011	0.016	0.013	0.03	0.045	0.315	0.324	0.85	0.856

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 9A. Household structure and Achieved Years of Schooling—Extensive Margin, Urban Sample

Exposure (at all) at	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
Age 0-12	-1.585*								
	[0.627]								
Age 0-5		-1.232***		-1.971***		-2.170***		-0.295	
		[0.299]		[0.280]		[0.455]		[0.303]	
Age 6-12		0.208	0.517	0.509	0.649	0.502	0.564	0.073	0.207
		[0.383]	[0.363]	[0.273]	[0.328]	[0.508]	[0.353]	[0.109]	[0.150]
Age 0-2			0.315		-0.104		-0.149		0.044
			[0.164]		[0.168]		[0.182]		[0.247]
Age 3-5			-1.013**		-1.060***		-1.057***		-0.477*
			[0.270]		[0.199]		[0.113]		[0.188]
Log of remittance received (0-12)						0.04	0.027	-0.002	0.013
						[0.066]	[0.081]	[0.039]	[0.060]
Log of remittance sent (0-12)						0.046	0.189	-0.14	0.05
						[0.130]	[0.124]	[0.123]	[0.107]
Log of net HH income per capital (0-12)						-1.598**	-0.489*	-0.184	-0.29
						[0.495]	[0.213]	[0.197]	[0.177]
Log of HH business exp per capital (0-12)						0.061	0.119*	0.041	0.082*
						[0.101]	[0.055]	[0.023]	[0.037]
Female				-0.197	0.023	-0.384*	-0.011	0.15	0.096
				[0.146]	[0.281]	[0.173]	[0.323]	[0.158]	[0.211]
Whether planned to give inheritance				0.35	-0.213	0.317	-0.113	-0.034	-0.232
				[0.678]	[0.304]	[0.732]	[0.311]	[0.370]	[0.147]
Num members lived outside				-0.402*	-0.044	-0.415***	-0.292**	0.234*	-0.023
				[0.170]	[0.089]	[0.087]	[0.086]	[0.093]	[0.049]
Mean age of members lived outside				0.018	0.044	0.014	0.041	0.036*	0.032*
				[0.017]	[0.033]	[0.021]	[0.034]	[0.017]	[0.014]
Household size				0.046	0.136	0.048	0.128	0.026	0.108
				[0.247]	[0.144]	[0.203]	[0.117]	[0.080]	[0.093]
Num. children under 15 years old				0.228	0.271	-0.037	0.237	0.101	0.084
				[0.401]	[0.188]	[0.413]	[0.144]	[0.146]	[0.099]
Number of family businesses				0.747	0.019	0.716	-0.478	-0.223	-0.365
				[0.428]	[0.262]	[0.639]	[0.466]	[0.139]	[0.315]
Observations	1,115	497	315	350	232	350	232	350	232
Adjusted R-squared	0.014	0.009	0.005	0.049	0.099	0.08	0.126	0.779	0.637

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 9B. Household structure and Achieved Years of Schooling—Intensive Margin, Urban Sample

Exposure Intensity at	OLS	OLS	OLS	OLS	OLS	OLS	OLS	FE	FE
Age 0-12	-1.277								
	[0.995]								
Age 0-5		-0.052		-0.787		-1.119		-0.247	
		[0.448]		[0.903]		[1.065]		[0.233]	
Age 6-12		-0.79	0.222	-0.625	0.392	-0.505	0.383	-0.025	0.165
		[0.396]	[0.278]	[0.475]	[0.203]	[0.614]	[0.323]	[0.172]	[0.211]
Age 0-2			0.38		-0.182		-0.227		0.128
			[0.216]		[0.294]		[0.321]		[0.307]
Age 3-5			-0.816*		-0.934**		-1.016**		-0.54
			[0.345]		[0.341]		[0.259]		[0.279]
Log of remittance received (0-12)						0.026	0.031	-0.003	0.014
						[0.064]	[0.082]	[0.039]	[0.058]
Log of remittance sent (0-12)						0.066	0.204	-0.138	0.054
						[0.132]	[0.119]	[0.122]	[0.102]
Log of net HH income per capital (0-12)						-1.532*	-0.498*	-0.174	-0.287
						[0.614]	[0.217]	[0.222]	[0.172]
Log of HH business exp per capital (0-12)						0.051	0.119*	0.04	0.082*
						[0.101]	[0.052]	[0.022]	[0.037]
Female				-0.126	0.064	-0.293	0.03	0.164	0.116
				[0.175]	[0.297]	[0.177]	[0.337]	[0.156]	[0.210]
Whether planned to give inheritance				0.376	-0.183	0.322	-0.086	-0.04	-0.211
				[0.805]	[0.316]	[0.841]	[0.329]	[0.372]	[0.140]
Num members lived outside				-0.381*	-0.047	-0.419**	-0.309**	0.236*	-0.028
				[0.166]	[0.094]	[0.127]	[0.091]	[0.092]	[0.040]
Mean age of members lived outside				0.022	0.048	0.019	0.046	0.037*	0.034*
				[0.018]	[0.033]	[0.020]	[0.034]	[0.017]	[0.014]
Household size				0.056	0.132	0.06	0.129	0.024	0.111
				[0.257]	[0.150]	[0.208]	[0.123]	[0.089]	[0.095]
Num. children under 15 years old				0.229	0.27	-0.027	0.228	0.105	0.072
				[0.394]	[0.187]	[0.406]	[0.140]	[0.155]	[0.096]
Number of family businesses				0.726	0	0.71	-0.491	-0.23	-0.367
				[0.418]	[0.254]	[0.678]	[0.445]	[0.141]	[0.316]
Observations	1,115	497	315	350	232	350	232	350	232
Adjusted R-squared	0.004	0.002	-0.003	0.026	0.089	0.054	0.119	0.779	0.636

Notes: *** 1%, ** 5%, * 10%. Robust standard errors and cluster at province level. All regressions are controlled for gender of household head, education level of head, age of head, an indicator variable equal to 1 if household works in agriculture.

Table 10: 2SLS (with extensive margin of family type)

	I Second Stage	II First-stage for Skip (0-5)	III First-stage for Skip (6-12)	IV Second Stage	V First-stage for Skip (0-2)	VI First-stage for Skip (3-5)
Panel A: 2SLS						
Age 0-5	-6.436					
	[8.077]					
Age 6-12	7.775			10.672*		
	[6.868]			[6.358]		
Age 0-2				-6.482		
				[6.794]		
Age 3-5				-9.321		
				[8.565]		
Panel B: First-stage						
Local nightlight (std) (0-2)		-0.327***	-0.205		-0.221***	-0.322***
		[0.055]	[0.145]		[0.048]	[0.043]
Num. new local factories (std) (0-2)		-0.045	-0.025		-0.018	-0.064
		[0.098]	[0.092]		[0.054]	[0.106]
Log of workforce of new local factories (std) (0-2)		0.145	0.125		0.114**	0.142
		[0.107]	[0.120]		[0.039]	[0.115]
Log of horsepower of new local factories (std) (0-2)		-0.061	-0.073		-0.074	-0.111*
		[0.042]	[0.075]		[0.038]	[0.050]
Log of capital funds of new local factories (std) (0-2)		0.042	0.019		0.053**	0.084*
		[0.034]	[0.091]		[0.020]	[0.041]
Local nightlight (std) (3-5)		0.021	-0.096		0.002	0.029
		[0.054]	[0.072]		[0.046]	[0.047]
Num. new local factories (std) (3-5)		0.104*	0.188*		0.027	0.106**
		[0.051]	[0.081]		[0.065]	[0.040]
Log of workforce of new local factories (std) (3-5)		-0.160**	-0.213**		-0.087	-0.140*
		[0.042]	[0.073]		[0.054]	[0.058]
Log of horsepower of new local factories (std) (3-5)		0.012	-0.004		-0.009	0.037
		[0.028]	[0.074]		[0.029]	[0.033]
Log of capital funds of new local factories (std) (3-5)		0.032	0.024		0.046	-0.009
		[0.042]	[0.072]		[0.051]	[0.053]
F-statistics (for first-stage regressions)		2.37	1.31		1.84	2.68
Tests of overidentifying restrictions (Chi-squared)	31.96			16.37		
Observations	497	497	497	497	497	497
Adjusted R-squared	0.169	0.018	0.005	0.182	0.011	0.022

Table 11: 2SLS (with intensive margin of family type)

	I Second Stage	II First-stage for Skip (0-5)	III First-stage for Skip (6-12)	IV IV: Second Stage	V First-stage for Skip (0-2)	VI First-stage for Skip (3-5)
Panel A: 2SLS						
Age 0-5	-2.723					
	[12.368]					
Age 6-12	-4.163			-2.444		
	[14.473]			[22.347]		
Age 0-2				0.644		
				[8.841]		
Age 3-5				-3.869		
				[23.399]		
Panel B: First-stage						
Local nightlight (std) (0-2)		-0.189***	-0.235		-0.142***	-0.236***
		[0.036]	[0.165]		[0.026]	[0.050]
Num. new local factories (std) (0-2)		-0.035	0.001		-0.032	-0.037
		[0.069]	[0.060]		[0.051]	[0.090]
Log of workforce of new local factories (std) (0-2)		0.124	0.054		0.116**	0.131
		[0.069]	[0.102]		[0.042]	[0.097]
Log of horsepower of new local factories (std) (0-2)		-0.081	-0.021		-0.059	-0.103
		[0.045]	[0.083]		[0.034]	[0.058]
Log of capital funds of new local factories (std) (0-2)		0.054*	0.001		0.038*	0.069
		[0.025]	[0.076]		[0.017]	[0.037]
Local nightlight (std) (3-5)		-0.024	0.037		-0.029	-0.019
		[0.031]	[0.055]		[0.035]	[0.045]
Num. new local factories (std) (3-5)		0.071*	0.114*		0.052	0.090**
		[0.034]	[0.054]		[0.042]	[0.031]
Log of workforce of new local factories (std) (3-5)		-0.122**	-0.139		-0.106**	-0.138*
		[0.038]	[0.084]		[0.027]	[0.057]
Log of horsepower of new local factories (std) (3-5)		0.01	-0.005		-0.009	0.029
		[0.028]	[0.017]		[0.024]	[0.034]
Log of capital funds of new local factories (std) (3-5)		0.02	0.016		0.035	0.005
		[0.047]	[0.039]		[0.043]	[0.052]
F-statistics (for first-stage regressions)		2.78	0.98		2.11	2.67
Tests of overidentifying restrictions	41.97			42.72		
Observations	497	497	497	497	497	497
Adjusted R-squared	0.169	0.024	0	0.184	0.015	0.022