# The Strength of Weak Ties:
# Indirect Exposure to Colonial Education and
# Intergenerational Mobility in Benin [*]

Leonard Wantchekon[†]

April 12, 2019

## Abstract

We use historical micro-level data from the first regional schools in colonial Benin to estimate the effect of education on social mobility over three generations. Since school location and student cohorts were selected quasi-randomly, the effect of education can be estimated by comparing the treated to the untreated living in the same village as well as those from villages with no school (Wantchekon et al. [2015]). We find positive treatment effects of education on social mobility across three generations. Surprisingly, the effect is strongest for descendants of grandparents who were exposed to education only through their social networks (the untreated living in villages with a school). We interpret this result as evidence of "the strength of weak ties" (Grannoveter [1977]). Finally, exploring the underlying mechanism of our results, we find that mobility from the first to the second generation is driven by parental aspiration, which is sustained by the risk attitudes and mobility of the third generation.

# 1  Introduction

Intergenerational Social Mobility refers to the relationship between parents' socioeconomic status and that of their children. It measures how better or worse off descendants are compared to their parents and captures the way personal capabilities, family background, social environment, and public policies shape individual well-being. As micro evidence for economic progress, intergenerational social mobility is considerably important to better understand the social mechanics of development, especially the role of human capital in promoting growth and reducing income inequalities. This paper aims to contribute to existing literature on intergenerational social mobility and its behavioral mechanisms.

We use a unique micro-level historical dataset to estimate the causal effects of education on social mobility across three generations in colonial Benin. We explore the underlying mechanism of intergenerational mobility by focusing on aspirations of the first generation and risk attitudes of the third generation. Our research design enables us to test both the direct and indirect effects of education and document the role of social networks in shaping intergenerational mobility.

While previous studies have established that a child's income and educational attainment are highly correlated with those of her parents, there are reasons to believe that families may be unable to maintain a strictly upward trend across multiple generations.[1] For instance, the second generation may face a different set of economic and political conditions or social norms when raising their children than those that their parents faced.

We provide a three-generation social mobility study with a unique social and demographic dataset from the first regional schools in central and northern colonial Benin. This longitudinal dataset is comprised of archival records, as well as face-to-face interviews with these schools' first students, their descendants of the following two generations, and contemporaries in treatment and control villages who were not educated (See Wantchekon 2012 and Wantchekon et al. 2015).

Prior to the period of the schools' founding, no meaningful European institutions had been established in the regions selected for this study. Furthermore, the Catholic missionaries and colonial authorities who founded these schools and selected the first students did so with very

---

[1]Ferrie et al. (2016), for example, study mobility over three generations from 1910 to 2013 and find substantial grandparent effects. Their results indicate that models with two generations (parents and children) underestimate mobility by about 20%.

little information on local conditions. As a result, we are able to construct treatment and control groups balanced on key observable characteristics. This allows the establishment of these schools to be treated as a quasi-experimental, exogenous shock to early education; in turn, it enables us to estimate the causal effect of education on social mobility, as well as mechanisms for its persistence, which include risk attitudes and time preferences.

We first look at social mobility across the entire sample of more than 2,000 families. We find strong persistence of both income and educational mobility for the second and, even more, for the third generation. In particular, while only 32 percent of low-income first-generation parents place their children in higher income categories, this number increases to 69 percent for second-generation parents. There is a similar but weaker trend in terms of education mobility, but only for parents with at least primary education. Furthermore, a family from a typical village in Benin (a control village) has a 9.5 percent chance of placing their descendants in their top income category, a figure similar to that of Mexico (11 percent). The most remarkable result is the strength of mobility among the descendants of those who were village-treated (that is, those exposed to education only through their social networks). For this group, the lowest income category has an 88 percent chance of placing their children in a higher income category, while middle-class parents have a 60 percent chance. Interestingly, mobility is relatively lower among those whose grandparents were educated: The respective numbers are 71 percent for the lower-income category and 66 percent for the middle category. As expected, the control group has the lowest level of mobility, with 42 percent of lower-income families placing their children higher, and 19 percent of middle-income families achieving this goal. In short, the indirectly treated fare better than the directly treated, which dominates the non-educated (i.e. the control group). We interpret this result as an illustration of Granovetter (1977)'s strength of weak ties theory.

Next, we explore the behavioral effects of the above results by looking into the relationship between social mobility and risk attitudes, measured with a survey questionnaire that captures social and financial risk aversion. The IV results show that social mobility leads to lower financial risk aversion (although it is significant only at the 10-percent level). The results are stronger for other behavioral variables such as self-reliance, work ethics, and life outlook. We interpret this as evidence that initial changes in educational opportunities have long-run implications for development, which are sustained within social networks through changes in risk attitudes and behavior.

3

Subsequent generations are carriers of the higher aspirations planted in the first generation.

These findings on mobility across multiple generations and its behavioral effects have significant policy implications. First, mobility should be treated as a direct metric of development, or at least, as a key correlate of development. In this sense, development can be defined as how well off a generation is in comparison to their parents' or grandparents' generation. Furthermore, focusing on mobility as an outcome means that the family, along with firms and governments, is a significant actor in development. Our "strength if weak ties" results indicate the crucial role of social networks in shaping intergenerational mobility.

## 2    Literature Review

The existing literature largely focuses on the relationship between social mobility and income inequality at the macro level. Several studies note that countries with higher cross-sectional income inequality have lower rates of intergenerational income mobility, a relationship often referred to as the "Great Gatsby Curve" (Krueger 2012). For example, Aaronson and Mazumder (2005), conducting a study using U.S. census data dating back to 1940, implement a two-sample instrumental variable estimator to stimulate the effect of a father's income on a son's income. They find, unsurprisingly, that lower social mobility is strongly correlated with higher income inequality. While they do not find large variation between states, Chetty et al. (2014) specifically examine heterogeneity in intergenerational mobility rates across the United States, determining that in addition to income inequality, income mobility is also strongly correlated with residential segregation, school quality, and family structure. Alesina et al (2018) conducted a similar study in a sample of 23 African countries, finding evidence for education mobility and reduction of inequality. But persistent achievement gaps exist between ethnic groups and regions driven in part by differences in past colonial investments. Two distinctive features of this paper are its historical microeconometric approach and its focus on behavioral mechanisms of mobility.

A number of studies have investigated the link between social mobility and income at the micro level, especially in developing countries. Using national survey data, Bossuroy and Cogneau (2013) document occupational mobility in five African countries, finding that sons of farmers very rarely leave agricultural work. This analysis, however, does not address mobility in education and

income, nor does it identify a causal effect of parents' occupations on children's future outcomes. It also does not examine changes in mobility over multiple generations. Our study, on the other hand, exploits a plausibly exogenous shock in the introduction of formal education to investigate the causal effects of mobility on a wide range of outcomes. Using survey data from a sample of individuals over multiple generations, we are also able to more rigorously explore the mechanisms of intergenerational transmission of human capital and social status, as well as the changes in intergenerational mobility over time.

More recent papers have identified the effects of income shocks on children's outcomes. Feigenbaum (2015) finds that the Great Depression reduced intergenerational mobility in hard-hit U.S. cities. Bleakley and Ferrie (2016) find that children and grandchildren of Georgian winners of the 1832 Cherokee Land Lottery were no more wealthy or highly educated than the descendants of non-winners. Our paper, in contrast, examines the effects of shocks to human capital rather than to income. Such shocks can affect children's outcomes in ways that income shocks may not. While income shocks may subside if parents do not invest in their own human capital or have a bequest motive, shocks to human capital (such as the opening of a school) are more likely to persist through nurturing or aspiration. Children can also emulate and reproduce their parents' investment in human capital, while income shocks may not be reproducible. Additionally, our results demonstrate that shocks to human capital have spatial externalities that income shocks may not.

In addition to examining the way that exogenous shocks to grandfathers' income impacts the social status of subsequent generations, this paper also studies the relationship between social mobility and individual behaviors and attitudes. We investigate how movements in income from parents to children affect risk attitudes and the psychological well-being of the latter. Durlauf and Shaorshadze (2014) measure social mobility using intergenerational elasticity and find that mobility is correlated with a country's overall income equality. They also examine how the correlation of income across generations could be the result of the intergenerational transmission of attitudes, highlighting how four types of influences (family, social-level, genetic, and assortative mating) can influence intergenerational mobility.

While Durlauf and Shaorshadze's study on intergenerational mobility examines how certain attitudes transmitted across generations impact social mobility, Lipset and Bendix (1959); Wilensky and Edwards (1959); Piketty (1995) focus on the reverse effect that social mobility can have on

5

attitudes and behaviors.[2] In fact, in a qualitative study of the rise of populist parties in Europe, Loch and Norocel (2014) note that the fear of downward social mobility and loss of social status are factors that can explain the rise of the Front National in France. Other studies examine the impacts of social mobility on behavior and attitudes more broadly. For example, Tiikkaja et al. (2013) study the likelihood of psychiatric illness among one million Swedish adults by examining whether they are in a better or worse social class than their parents. Using those in the same social class as their parents for the control group, the authors find that adults who moved up in class were less likely to develop a mental illness.

Along the same lines, our study highlights how social mobility can influence mental health, life outlook, risk aversion, and work ethics. In fact, social mobility, or threat of downward mobility, could explain the marked increase in mortality of middle-aged white non-Hispanic men and women in the United States from 1999–2013 resulting mainly from suicides and substance abuse (Case and Deaton 2015).

Lastly, the study contributes to gaining a deeper understanding of the relationship between education and social mobility. While many studies focus on the direct effect of education on social mobility (Breen and Karlson (2013); Corak (2013)), our study extends this analysis by examining the indirect effect that a grandfather's education can have on his descendants across multiple generations. In light of theoretical discussion of the role of luck (income shock) or effort (aspiration shock) in driving social mobility, the evidence presented in this paper indicates that indirect effect or effort might dominate the direct effect or luck in sustaining education and income mobility (see Piketty 1995, 2000; Benabou 2001).

## 3  Historical Background

French troops, led by General Alfred Dodds, colonized Benin, formally known as the Kingdom of Dahomey, in 1894. The country officially became colonized after Behanzin, the King of Dahomey, surrendered the kingdom's capital city to Dodds after three years of fighting. Prior to this conquest of Dahomey, Catholic missions were established in a number of towns: some, such as Agoue (1874) and Porto Novo (1864), saw missions (in the form of commercial trading posts and military

---

[2]See also Benabou and Ok (2001) and Alesina et al. (2016).

settlements) established in regions with an existing European presence, whereas others, such as Zagnanado (1895), had no previous European influence.

The Roman Catholic Church's presence was mainly limited to coastal areas until after the French conquest of Dahomey, after which missions expanded to central and northern regions. According to Vatican records, the evangelization of the Slave Coast – the region between the Volta River in present-day Ghana and the Niger River in Nigeria – was one of the main priorities of the Church at the end of the 19th century. In 1861, the Church established an apostolic vicariate, a form of territorial jurisdiction, in Agoue at the border between Togo and Dahomey, but the vicariate was limited to the Littoral region (see Figure A.1 in Online Appendix A). Dupuis notes that the expansion of the Catholic missions into the hinterland was difficult due to the Kingdom of Dahomey's "closed" and "impenetrable" nature (1961, p. 10). However, after the French conquest of Dahomey, missionaries started expanding the boundaries of the vicariate upwards from Agoue to the central regions of Zagnanado and Ketou. While missionaries were able to expand into central regions, French military explorers faced strong resistance in northern towns such as Atakora, Haut-Nigera, and Borgou (Report 1906). It was thus not until 1920 that the colony was completely pacified, and Porto-Novo was established as the capital.

Dahomey fell under the control of two administrations, the French colonial government in Dakar and the Vatican's apostolic vicariate in Agoue, both of which faced similar obstacles to expanding their influence across the territory, despite having differing objectives. The French colonial government, seeking to maximize revenue, faced challenges to its rule due to sporadic armed resistances in the north. The Vatican, on the other hand, sought to maximize its religious influence but was constrained by a strong Islamic presence in the north and traditional animistic practices in the south. Despite these distinct challenges, both administrations had very limited knowledge of the country's human resource capacity beyond coastal areas. Cultural differences played a large role in minimizing interaction between the settlers and local populations. For example, a French report highlighted the high level of hostility toward the colonial presence, which included its education system and cultural practices (Report (1906), pp.64-71).[3] Additionally, the lack of diversity in the occupations and living standards of the local population made inference about the local level of

---

[3] The report states, "Unfortunately, there is among many natives, a high degree of mistrust and resentment vis-a-vis the White settlers, which proves that there is very little contact between White settlers and the Africans" (p. 102).

human capital difficult in the absence of extended interaction with the people.[4]

Given these challenges, both the Vatican and the French colonial government prioritized primary education as a precondition for successfully carrying out their "civilizing missions" (Dupuis (1961), p. 69). In fact, in towns such as Zagnanado (1895), Kandi (1911), Save (1913), and Natitingou (1922), schools were opened immediately in their respective regions following the end of the colonial war. These schools were established to train civil servants, such as translators, nurses, accountants, and security guards, to serve in the new civilian colonial administrations "or cercles", which were established 6–10 years after the first schools were opened.[5] In each case, human capital investment preceded colonial establishments.

## 4    Data Collection and Sampling Procedures

The data for this article comes from Wantchekon (2012), which used face-to-face interviews and archival research on the first four regional schools in Benin. Established by colonial administrators and Catholic missionaries, these schools were located in four sites: Kandi, Natitingou, Save, and Zagnanado. In this section, we explain in detail the selection of (i) treated villages where the schools were set up and control villages where the schools could have been established, and (ii) treated students and their descendants of the following two generations and control children.

### 4.1    Site Selection

The four locations examined in this study are 100 km or more from the Atlantic Coast, the southern border of the Kingdom of Dahomey. Before these schools were founded, these four places had no significant European exposure in the form of institutions, commerce, religion, or politics.[6] Meaningful influence from European institutions before the establishment of the schools would create two problems in this study. The first issue involves self-selection into schools. Coastal areas (i.e., Porto Novo, Agoue, and Cotonou) had extensive interactions with European traders. Residents

---

[4]The vast majority of the local population was subsistence farmers (see D'Almeida (1990).

[5]Zagnanado was a Catholic school that trained both religious teachers and civil servants.

[6]Dupuis (1961) wrote: "Despite being the first settlement of the "Societes des Missions Africaines" the Kingdom of Dahomey was inaccessible for Europeans. Religious conversion in the Central and Northern part of the territory became possible only after the Kingdom was conquered by the French colonial troops"(p. 10). Even after the French conquered the territory, the Europeans only knew the coastal part of territory, albeit imperfectly (D'Almeida (1990), p.20)

with formal education, including some knowledge of the French language, would be more capable of engaging with the European merchants. As a result, certain residents in these four areas would have self-selected into education. The second issue concerns isolating the impact of newly established schools from previous European institutions on future development results at the individual and regional level. Indeed, these areas simultaneously experienced the increased presence of European institutions and the establishment of colonial schools, which complicates disentangling the effect of education from that of colonial institutions. For these two reasons, villages within 100km of the coast were not included in this study.

The sites selected for this study had no formal educational institutions before the establishment of the colonial schools. The absence of European or other types of schools fixes the self-selection problem in which residents with more knowledge about the advantages of education were more likely to attend school.[7] Given that prior generations did not have any formal education, the children who enrolled in these schools were the first in their communities to receive an education. Against this background, the two defining traits of these sites are (i) limited or no prior European economic influence, and (ii) no prior formal European-style education. The four sites possessed the first regional schools in the hinterland of Benin.

## 4.2  Selection of Control Locations

If the treatment and control villages had different characteristics before the introduction of the colonial schools, the results could differ because of these initial disparities. As a result, for the comparison group, we identify villages that we believe were just as likely to be chosen by colonial authorities for school establishment. To select our comparison group, we rely on two mechanisms. First, we leave out villages within a 6–7km radius from the school site, as they lie close enough to the schools that children from these villages might have been able to attend. The great majority from the first cohort of students had to commute to the schools every day by foot because boarding facilities did not exist. Students within the 7km radius would have had to walk 3 to 4 hours, since the villages were only connected through unpaved trails.[8] We therefore conclude that children from

---

[7]See pp. 17–18 in Dupuis (1961).

[8]In his 1995 publication, d'Almeida Topor argued that adults usually had to walk 10 hours, or 25km, from their homes to the local markets. A a result, it should take at least 3 to 4 hours for 10- to 14-year-old students to walk 7km to school.

villages outside the 7km radius were very unlikely to go to school. Our assumption is confirmed by the data from the first generation, which shows that no student living with his or her parents had to walk more than 6km to attend school.[9]

Our sample of candidates for control villages includes those within a 7–20km radius around the school. As previously mentioned, children living in villages more than 7km away would not have gone to school. Meanwhile, villages over 20km away from the schools would be so far away that their region might possess different geographic and ethnic traits. We thus assume that villages within the 7–20km radius from the school site could have been chosen by the colonial administration or missionaries as a viable site for a school. We confirm our assumption below by providing an example from Zagnanado (See Section 2.3). Our data indicates that the treatment and control villages had very similar geographic, ethnic, social, and political characteristics.[10] Map A.8 of Zagnanado, in Section 1 of Online Appendix A (Wantchekon et al. 2015), displays the school at the center of the circle; the small circle is the treatment area (6–7km from the school), and the bands are the control areas (7–20km from the school).

Within the 7–20km radius from the school, we randomly choose one control village.[11] To showcase the selection process of the control locations, we rely on current maps from the four sites (see Map C.1 in Online Appendix C, Wantchekon et al. (2015)). To the best of our knowledge, the distribution of villages in the current maps is identical to the distribution that was in place when the schools were founded. By checking colonial maps and a population census from 1931, we established that there is no evidence of the emergence of a new village or complete disappearance of a village after the setting up of the schools. In total, there are 18 potential control villages in Natitingou, 17 in Kandi, 10 in Save, and 15 in Zagnanado. In the latter case, all of our sample villages can be observed on a map issued by the missionaries in 1895 (see Maps A.2, A.4, A.6, and A.8 in Online Appendix A, Wantchekon et al. (2015)).

This matched-pair design is similar to that of Dell & Olken (2017), who assess the long-term

---

[9] Twelve students (mostly from Zagnanado) lived more than 6km away from the school. Nevertheless, school records and qualitative evidence demonstrate that those students from Zagnanado were living in a dormitory, whereas those from Natitingou were living with foster families near the school (*Centenaire de l'Arrivee des Missionnaires au Pays Angolin* (1895-1995), p. 17). The six children from Zagnanado were perhaps children of villagers from Baname and Cove converted by Schenkel and Steinmetz early in 1895 during their trip back from Pira through Zagnanado (*Centenaire de l'Arrivee des Missionnaires au Pays Angolin* (1895-1995), pp. 10–14).

[10] The balanced covariate table is available upon request.

[11] In Save, the size of the population of the first randomly selected control village was significantly lower than in the treatment village; we selected another one at random.

effects of sugar factories on local outcomes in Java by comparing actual factory sites to areas that were suitable for factories but were not chosen due to spacing constraints. Unlike Dell & Olken (2017), however, we select control villages which could have received schools based on well-founded historical counterfactuals. We also show balance in pre-treatment variables between the treated school locations and untreated villages, and for treated students and untreated, demonstrating the viability of these counterfactuals.

### 4.3   Illustrative Example: Zagnanado.

Catholic missionaries from the Société des Missions Africaines in Lyon built one missionary school in the Agnonlin region – a province of the Kingdom of Dahomey – in 1895. After the fall of the Kingdom of Dahomey in late 1894, the missionaries increased access to the interior of Benin. As of 1895, though, the French had not yet established a formal colonial administration in the area.[12] The pamphlet "Centenaire de l'Arrivee des Missionaires au Pays Agonlin", which is based on diaries and reports of some of the founders of the Catholic school of Zagnanado, gives interesting insights about the process that led to establishing the school (see Map A.2 and Map A.8 in Section 1 of Online Appendix A, Wantchekon et al. (2015)).

At the start of 1895, two missionaries of the Société des Missions Africaines (SMA), priests Pierre Schenkel and Francois Steinmetz (who would become Bishop Steinmetz), traveled inside the Dahomey; a journey on foot, lasting more than two months, led them from Agoue to Pira, passing by Djaloukou and Savalou. They were the first two Europeans to head to the sources of the Zou. The two priests came down from Pira through Dassa and Abomey, where they diverted slightly towards the East to Agonlin, which took two days to reach on foot from Dassa(. . .). In a neighboring village, much sympathy was shown towards one of the ailing priests; they wanted him to stop his journey for some time because of his poor health and the rough roads that lay ahead of him. *Faced with his refusal to stop, they cleared and weeded out two kilometers to ease his travel. It is as a result of this trip, and based on the report and instructions of the two priests, that the mission of Zagnanado was founded.* (*Centenaire de l'Arrivee des Missionnaires au Pays Angolin* (1895-1995), pp. 10–12, emphasis added).

The school opened two months after the trip, when Father Schenkel came back to the region,

---

[12]See Centenaire de l'Arrivee des Missionnaires au Pays Agonlin (1895–1995), pp. 10–14.

but this time with Michaud, not Steinmetz. Starting in the coastal city of Porto Novo, the two men traveled up the Oueme River, deciding to stop at the small town of Sagon, in the heart of the Agonlin-Zagnanado region. They settled in a small town named Assiadji, located 5km from the left bank of the river (*Centenaire de l'Arrivee des Missionnaires au Pays Angolin* (1895-1995), p.12). Nothing in the diary shows a preference to go to the left, instead of the right, side of the river. Additionally, we could not find evidence that features on the right side of the river made it unfit for a school. In fact, ten years later in 1905, colonial missionaries ended up setting up a school on the right side of the river in Ketou. All of these facts lead to the belief that the decision to settle on the left bank of the river was arbitrary. At that time, the village of Zagnanado and the surrounding smaller settlements of Doga, Houegbo, Don, and Agnangon had a total population of approximately 2,000 residents. Located within a 7km radius of the school, this cluster is part of the treatment area. We consider the 7–20km band around the school to be the control area. Sagon, Houinhi, Wakon, Agonve, and Kpedekpo are some villages of the control area. Out of 15 potential control villages, Kpedekpo was randomly selected as the control village.

From the data we gathered, we see that Kpedekpo and Zagnanado are very similar on observable factors, such as ethnic composition, political and institutional background, and distance from the port. Indeed, the only differences between Kpedekpo and Zagnanado are land fertility and mean elevation.[13]

## 4.4   Individual-Level Data Collection and Survey

The research design includes three groups of individuals: those who lived near, and enrolled in, a school (TG1); those who lived near, but did not enroll, in a school (TG2); and those who lived outside the radius of a school (C). Researchers from the Institute for Empirical Research in Political Economy (IERPE) in Benin collected data on these individuals in three phases. During Phase 1, researchers identified the first two cohorts of students from colonial schools (TG1) and a sample of their unschooled peers (TG2, C) at four sites (Kandi, Natitingou, Save, and Zagnanado) using school, colonial, and family archives, as well as in-person interviews of local informants. In Phase 2, informants with close ties to subjects identified in Phase 1 were asked to complete social and demographic surveys. Finally, Phase 3 consisted of demographic and behavioral surveys of

---

[13]The balanced covariate table is available upon request.

third-generation descendants of subjects identified in Phase 1. The survey questionnaire (see the Appendix) covers the standard questions on risk aversion, optimism, and mental health. Additional details on the survey logistics and measures of data reliability are available upon request.

## 4.5   Sampling and Archival Sources

The research team used extensive archival sources, mainly school records, colonial administration records (e.g., ID cards), and family archives to identify the individuals in the three groups described above and their descendants. These sources enabled researchers to identify the names of the treated individuals and the first cohort of students, to determine several relevant variables, and to adjudicate conflicting information provided by the informants. Researchers located student records for individuals in TG1 for two of the four selected schools: (1) Zagnanado's Catholic school and (2) the public school in Natitingou. Because Zagnanado had a Catholic school, the church preserved its records. Additionally, researchers were able to locate information from the Société des Missions Africaines in Lyon, France. School officials (a priest in Zagnanado and French civil servants in other locations) created the archives, which were kept either at the school or at the home of the principal.[14] These records include information such as students' names, an evaluation of students' academic performance, and their parents' names and professions.[15] Records for the school in Save were incomplete, but the research team was able to locate several family archives. In Kandi, the school had no archives of student records; therefore, researchers relied primarily on colonial administrative archives and face-to-face interviews of individuals (Lafia N'Gobi Gouda and Demon Komkom) who were born around 1916 and knew the students relatively well. They also relied on a monograph written by former Kandi students on the history of the school.

Given that there were no school archives for unschooled subjects in treatment and control villages TG2 and C, respectively, researchers used a backward sampling intended to identify individuals in these groups. Enumerators were sent to these sites to systematically sample from village inhabitants aged 40 or above. They selected a random starting point from the sampling frame and then chose households at regular intervals (e.g., fifth, tenth, fifteenth) to select individuals.

---

[14]The IERPE research team located the student records in Zagnanado at the home of Mr. Aihounton, a former principal at the school, who took it from the school when it was closed in 1975 by the military government.

[15]Documents III and IV in the Online Appendix show photographs of the first two cohorts of the Zagnanado school and its founders.

To be included in the final sample, an individual had to be at least 40 years old, and their father or grandfather had to be close in age to students from the regional school. In order to identify subjects, selected individuals were asked to identify their predecessors. The individual became a subject if the predecessor was from the same age cohort as those of the treatment group. We do not include data on the selected individual, however, if his predecessor was from a different age cohort. While this type of sampling of untreated individuals may raise concerns about potential bias – given the relationship between social status and the probability of being sampled – we believe these issues are minor for several reasons. First, although there might be a risk of oversampling the wealthy because they have more descendants or because they may migrate more often, low levels of pretreatment inequality in social status and a low tendency to migrate mitigate these concerns. Second, any sampling bias is likely to attenuate our results. Researchers also used available colonial and family archives, along with face-to-face interviews, to verify information on the subjects. Colonial administration archives are kept at current local government offices, as colonial districts from the late colonial period became sub-prefectures or communes that are now the sites of Benin's local governments. The IERPE research team also collected information about subjects through photo archives provided by their families. These archives sometimes included information about subjects' assets, such as houses, bicycles, and clothing. For example, Documents VII and VIII in the Online Appendix (Wantchekon et al. 2015) show a subject from Save in a colonial-style dress in his house. Photos sometimes included private family correspondence that provided indication of subjects' social status and political views. The availability and quality of the photo archives resembled that of the school records; Zagnanado and Natitingou had more robust archives, while Save's and Kandi's were relatively lacking. To account for the variation from one site to another, more field researchers visited Kandi and Save, and the interviews of the informants in these regions were much longer than those in Zagnanado and Natitingou.

## 4.6   The Survey

Besides the archives, field researchers gathered data via questionnaires given to local respondents and the third generation descendants from the first cohort of students and their unschooled counterparts. The first round of questionnaires was administered to local respondents who were either informants (the primary sources of information) or counter-informants, who served to cross-validate

the information given by the informants. All respondents surveyed have close familial or personal ties to the original students or the students' unschooled contemporaries.

Children, grandchildren, siblings, and neighbors comprised the pool of respondents for the questionnaire regarding the first generation. They were surveyed to inform the personal characteristics and ties to the subject. When several informants were available, we gave preference to the oldest (in terms of age) or the informant closest to the subject. Unless the informant was not lucid, the oldest informant would most likely have more reliable information than younger ones, since she or he probably interacted more with the subject than his or her younger counterparts.

To determine the quality and the reliability of the data provided by the informants, another questionnaire was administered to informants. The questionnaire's elements focused on the nature and time span of their relationship with the subject. In each location, a number of counter-informants were asked to corroborate the informants' data. A set of questions in the informant questionnaire was posed to counter-informants to check whether the responses of these two groups matched.

In addition to surveys on first and second generations, a third survey was administrated on the third generation: grandchildren of subjects from TG1, TG2, and C. The survey covered the basic demographic characteristics such as age, gender, and income. It also covered risk and time preference, work ethics, life outlook, and mental health. More specifically, one section of the survey captured perceptions of social, financial, or physical risk by giving subjects a list of actions and hypothetical scenarios. Action questions included lending money to a friend, driving at high speeds on rough roads (S1.Q14), walking home alone in a dangerous area (S1.Q10), driving a motorcycle without a helmet (even though it is enforced by the law) (S1.Q15), and denouncing a neighbor or a friend for illegal activity (S1.Q20).[16] Experimental evidence finds such "context-specific" risk questions to be the best predictors of actual risk-taking behavior in a specific domain, outperforming surveys of general risk attitudes and standard "hypothetical lottery" questions (Dohmen et al. 2005).

We also gave respondents some hypothetical scenarios with a specific set of questions. For example, we asked respondents several questions regarding two job option scenarios, one with a

---

[16]Each action had three categories of questions: (a) ...are you likely to adopt the behavior? (b) ...do you think the action is risky? and (c) ...do you think the action is beneficial? These questions had four response options that ranged from "not at all likely' to "very likely". The fourth option was "I don't know".

fixed salary and one with a variable amount that could lead to both higher and lower earnings in comparison to the first option. In addition to this scenario, we asked questions about trust: the level of trust towards his or her community, parents, neighbors, and other people he or she does not know.

As for time preferences, respondents were asked, for example, whether they preferred to receive a certain amount of money in a month, or a higher amount in seven months. The third section of the survey covered the extent to which respondents agreed or disagreed with a list of statements regarding attitudes toward work, such as intrinsic motivation, collegiality, and corruption.

Finally, we asked questions about mental health and life outlook. Respondents' mental health was captured through questions such as sense of loneliness, depression, and sleeplessness, whereas their life outlook was recorded through questions about perceptions of social mobility and life satisfaction, personal ambition, and optimism (see details on the survey logistics and measures of data reliability in the Online Appendix, Wantchekon et al. (2015)).

## 4.7 Data Credibility

Measuring the credibility and reliability of the information collected from informants constituted a major challenge in the data collection process. Criteria for establishing credibility relied on the extent of previous interactions between the respondent and the subject, with particular attention paid to the nature of the relationship and the time span of the interaction. For example, researchers preferred family members to informants from outside the family such as neighbors or friends. However, given that most informants were family members, credibility also depended on distance and length of interactions with the subject. As a result, preference was given to older respondents, who were more likely to have known the subject for a longer period of time. Furthermore, because distance was a relevant criterion, children or siblings who had lived with the subject were preferred to those who had not lived with the subject or to those who had but for a shorter time.

In order to measure reliability of the information, two strategies were employed: demanding supplementary data from informants and using counter-informants. For the first strategy, informants were asked to provide additional proof for every piece of information provided. For example, physical data in the form of photos of the subject or documents pertaining to the subject constituted the most reliable form of proof. If this data was not available, researchers prioritized

respondents who had lived with the subject for a significant amount of time. The second strategy, using counter-informants who were selected to answer the same questions posed to the original informants with supporting evidence if possible, aimed to verify that there was no mismatch between data provided by informants and counter-informants. Based on this strategy, information provided by informants was considered reliable if confirmed by counter-informants. In the case of a mismatch in information, preference was given to information provided by the closest informant (the Online Appendix, Wantchekon et al. (2015), provides additional details).

Overall, data credibility was established using the following information hierarchy. Top priority went to archival evidence; this was followed by physical data, such as photos or assets like the subject's actual house. If archival evidence was lacking, preference was given to information given by a subject and verified by a counter-informant. Based on the information displayed in Table A3.1 in Appendix A, the best-matched variables are housing (78.65%), means of transportation (63.77%), dressing style (82.68%), and profession (49.81%).[17] If a mismatch occurred, information from the respondent who resided with the informant for a longer time was given a greater weight. Section B4 in the Online Appendix (Wantchekon et al. 2015) displays the descriptive statistics of the credibility measures of the variable.

## 5    Measures of Mobility

A number of measurements exist to evaluate intergenerational mobility. The measurements can be broadly categorized into the sociological or economic literature (Torche 2015). Sociologists prioritize occupational measures over earnings and income based measures of mobility. They usually rely on occupations that they rank into a one-dimensional status hierarchy or collapse into aggregated classes. Occupational status is operationalized as a weighted average of the mean level of earnings and education of particular occupations (Torche 2015). Another method that sociologists rely on for analyzing intergenerational mobility is class mobility. This measurement categorizes classes into groups based on particular occupational assets that influence life opportunities such as income, health, and wealth (Grusky and Weeden 2006), and which are shaped by economic and institutional factors (i.e., technological change, welfare, and labor market policy) (Breen and Whelan 1996).

---

[17]Given the absence of birth certificates and maternity hospitals prior to the establishment of the colonial administration, birth dates are not well matched (30.54%).

Both of these measurements, occupational status and class mobility, have been extensively used to analyze the mediating role of education in social mobility.

There are a number of limitations to the sociological approach. Regarding occupational status, the literature often does not report the distribution of occupational status. This happens because they assume normality, or the intergenerational regression coefficient is not influenced by departures from this assumption.[18] As for the measurement of class mobility, researchers disagree as to which unit of analysis yields the most accurate results. Advocates of class analysis argue that the family constitutes the main unit of analysis (Erikson and Goldthorpe 1992), though other alternatives have been suggested, such as a combination of the class positions of spouses, the class position of the father/husband, or the class position of the spouse with the higher-class position or labor market engagement (Torche 2015).

Economists tend to focus on earnings mobility, also known as the intergenerational income elasticity (IGE), which examines "[...] the intergenerational association by means of a linear regression of the log-transformed measure of parents' and children's earnings, or the percentile rank of these respective earnings."[19]

The log-transformed measure mitigates the strong right skew of earnings distribution. As a result of the double-log formulation, the elasticity of the regression coefficient ends up measuring the average percent change in children's earnings associated with a one percent change in parental earnings (Torche 2015). As the measurement evaluates the association with percentages, it is able to adjust for economic contraction and growth over time. The elasticity, then, is a measurement of relative mobility, not absolute. It should be mentioned that the intergenerational elasticity is influenced by the degree of earnings inequality in each generation and its change across generations. Most often, empirical values of elasticities are between 0 and 1, though they might take higher values (larger than 1) if earnings dispersion across generations dramatically increases (Torche 2015). Given the nature of our data and our focus on the direction of social mobility, we opt to measure mobility by using a transition matrix along side a standard ordered logit model. The measure of intergenerational earnings elasticity/rank coefficient has been found to have three sources of

---

[18]Their assumption might cause problems, however, if the population under analysis has kinks in its distribution. Additionally, the sociology literature has not made use of the economic mobility camp's insights, which demonstrate that comparing regression coefficients across groups can lead to a flawed assessment of mobility (Torche 2015).

[19]Florencia Torche, "Analyses of Intergenerational Mobility: An Interdisciplinary Review." The ANNALS of the American Academy of Political and Social Science 657, no. 1 (2015): 44.

bias: (1) transitory (and autocorrelated) fluctuation around long-run income; (2) life cycle bias; and (3) age-related errors in variable bias (Jenkins (1987); Mazumder (2005); Black and Devereux (2011)). Measurement errors resulting from these three biases have mostly been addressed by relying on administrative data, such as social security and tax data. An alternative to reduce measurement error is using an instrumental variable approach – in other words, a variable unrelated to measurement error, but related to parents' earnings, must be found (Torche 2015).

To measure social mobility, we construct a variable that relies on data from third-generation (grandchildren of the first cohort of students) individuals. Our measure of social mobility between the first, second, and third generations uses a wealth composite comprising of income, housing quality, and individual and family assets, among others. For the third generation, we also have monthly wage and monetary income. Using this information, we measure social mobility from the second to the third generation in four steps. First, we estimate an ordered logistic model to capture the probability of moving on the wealth scale from parents to children. Second, we compute the average marginal effect ($AME$) of this logit regression. Third, we multiply the absolute value of this marginal effect by the gap between the second- and third-generation incomes, or the difference between children and parent status ($\Delta W$). The wealth scale is comprised of three categories, where 1 means low wealth, 2 medium wealth, and 3 high wealth. As a result, the change from parent to child $\Delta W$ can take integer values between $-2$ and 2. The raw measure of social mobility (*socmob*) is thus represented by $socmob = |AME| \times \Delta W$. Since $\Delta W$ captures the direction of the change, a negative value signifies downward mobility, while a positive value signifies upward mobility. This change is weighted by the absolute value of the average marginal effect coming out of the logit prediction to capture the difficulty to make that step on the wealth scale. The intuition for this weighting is the fact that the average marginal effect measures how much more likely a child would have been to achieve their resulting wealth class had the parents been in a higher wealth class. If this number is large and given the parents were actually not in the higher wealth class, this means that the child must have fought against considerable odds to end up in their wealth class. This is reflected in a higher social mobility score.[20] The fourth and final step in the construction is a standardization of the raw measure for ease of interpretation of the empirical results.

---

[20]The same logic applies to cases of negative wealth class changes with regard to one's parents.

# 6  Empirical Analysis

In this section, we present the results of our econometric analysis. We provide evidence for upward education mobility for both the second generation and third generation, and upward income mobility for the second generation and downward income mobility for the third generation. We also establish the relationship between income mobility and a number of behavioral outcomes. In each case, we provide transition matrices that describe the probability of mobility from one generation to the next and the ordered logistic model that provides treatment effects of having schooled grandparents or living in a schooled village.

For the transition matrices, the probability of being in a particular wealth class or education category is estimated with an ordered logistic model of the following form:

$$
\begin{aligned}
Pr(Y_{i,k} = j | Y_{i,k-1}) &= Pr(\alpha_j \leq \beta Y_{i,k-1} + \epsilon_i \leq \alpha_{j+1} | Y_{i,k-1}) \\
&= \Lambda(\alpha_{j+1} - \beta Y_{i,k-1}) - \Lambda(\alpha_j - \beta Y_{i,k-1}) \quad (1)
\end{aligned}
$$

where $Y_{i,k}$ is the wealth scale or education category of individual i from the $k$-th generation (with $k = 2, 3$), and $Y_{i,k-1}$ is the wealth scale or education category from the previous generation. The assumption that the error term $\epsilon_i$ follows the logistic distribution $\Lambda$ gives us the standard ordered logit setup. The threshold values $\alpha$ and the parameter $\beta$ of this model are estimated. From the estimated model, we then obtain the predicted probabilities of the latter generation. We estimate this model to generate transition matrices for the full sample and the three different treatment groups: Treated individuals in treatment villages (individual-level treatment), untreated individuals in treated villages (village-level treatment), and individuals in control villages.

In order to provide estimates of the treatment effects, we then estimate the following similar ordered logit model:

$$
\begin{aligned}
Pr(Y_{i,k} = j | T_i) &= Pr(\gamma_j \leq T_i'\delta + e_i \leq \gamma_{j+1} | T_i) \\
&= \Lambda(\gamma_{j+1} - T_i'\delta) - \Lambda(\gamma_j - T_i'\delta) \quad (2)
\end{aligned}
$$

where $T_i$ is a vector containing dummies for individual-level and village-level treatment. The remaining variables are defined similarly to the above specification. This ordered logistic regression

is implemented for both wealth scales and education categories as outcome variables. All results
are presented below.

## 6.1 Second-Generation Results

### 6.1.1 Education

We categorize respondents' education level as one of the following: no education (0), primary
education (1), secondary education (2), or university or greater education (3). It is noteworthy
that only very few individuals from the first generation who attended school went beyond primary
school and, in that case, received secondary school education. In the second generation, however,
more people achieved secondary and even tertiary education. Table 6.1 A presents the transition
matrix.

**Table 6.1 A — Transition Matrix, Education Outcomes
from First to Second Generation**

| | | Full Sample | | | | |
| | | Second Generation Education Category | | | | |
| | | 0 | 1 | 2 | 3 | N |
|---|---|---|---|---|---|---|
| First Generation Education Category | 0 | 51.46% | 32.55% | 12.57% | 3.42% | 811 |
| | 1 | 38.17% | 37.19% | 18.91% | 5.73% | 682 |
| | 2 | 26.43% | 37.60% | 26.52% | 9.45% | 38 |

*Note:* Computed using Ordered Logit Regressions.

Roughly half of the first generation for which second-generation education is known received
no education. The table shows that the probability of second-generation children of uneducated
parents receiving any education is about 50%, compared to more than 60% for children of educated
parents. Second-generation children of educated parents are twice as likely to receive university
education.

Tables I and VII from Wantchekon et al. (2015) present the summary statistics on a number
of other outcomes of the second generation (occupation, assets, and social networks). The most
spectacular improvement is by descendants of the "village-level" treatment group, those who were
unschooled in a treatment village. Children of this group have a 52% primary school enrollment
rate, and only 10% became farmers, as opposed to 78% of their parents. Indeed, they nearly caught
up with the children of those who received primary education. The results from Wantchekon et

al. (2015) suggest that aspirations and role models are possible mechanisms driving this impressive upward mobility.

Table 6.1 B provides a sense of the relative magnitude of the effects of the "village-level" treatment versus the "individual-level" treatment (actually receiving primary education). Children of fathers who lived in villages with colonial schools are 26% more likely to receive some education than children of fathers who lived in control villages. Within treated villages, children of fathers who attended school are 5% more likely to receive some education than children of fathers who did not. The effect of living in a schooled village on children's education outcomes is much greater than the conditional effect of attending the school while living in the village.

### Table 6.1 B –  Ordered Logit of First to Second Generation Education: Marginal Effects

|  | Category | | | |
| VARIABLES | 0 | 1 | 2 | 3 |
| --- | --- | --- | --- | --- |
| Individual-level treatment | -0.0476** | 0.0156** | 0.0232* | 0.00882* |
|  | (0.0241) | (0.00786) | (0.0119) | (0.00468) |
| Village-level treatment | -0.259*** | 0.0852*** | 0.126*** | 0.0480*** |
|  | (0.0361) | (0.0132) | (0.0190) | (0.00898) |
| Observations |  |  |  | 1504 |

*Note:* Robust standard errors are reported in parentheses.  * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

### 6.1.2  Income

To assess income, Wantchekon et al. (2015) constructed a living standards scale for the first and second generations. This scale is based on a factor analysis using several indicators, such as housing quality, land and shop ownership, household equipment, means of transportation, travel patterns, household equipment, access to clean water, and access to electricity. Table IX (735) shows a positive correlation between the income scales of the second generation and their parents. This is unsurprising given the strong correlation between children's and parents' education, discussed above.

Table 6.1 C shows the income scale transition matrix between the first and second generations. Overall, sampled second-generation individuals born in low-income or high-income families have nearly a 70% chance of remaining in that income category. Second-generation individuals born to

## Table 6.1 C – Transition Matrix, Wealth Outcomes from First to Second Generation

|  | | Full Sample | | | |
|---|---|---|---|---|---|
|  | | Second Generation Income Category | | | |
|  | | 1 | 2 | 3 | N |
| First Generation Income Category | 1 | 68.46% | 13.42% | 18.13% | 606 |
| | 2 | 40.30% | 18.12% | 41.59% | 359 |
| | 3 | 17.35% | 13.05% | 69.60% | 329 |

|  | | Treatment Villages: Treated Individuals | | | |
|---|---|---|---|---|---|
|  | | Second Generation Income Category | | | |
|  | | 1 | 2 | 3 | N |
| First Generation Income Category | 1 | 70.94% | 12.72% | 16.34% | 162 |
| | 2 | 40.92% | 18.31% | 40.78% | 202 |
| | 3 | 16.42% | 12.76% | 70.82% | 317 |

|  | | Treatment Villages: Untreated Individuals | | | |
|---|---|---|---|---|---|
|  | | Second Generation Income Category | | | |
|  | | 1 | 2 | 3 | N |
| First Generation Income Category | 1 | 59.99% | 16.38% | 23.63% | 313 |
| | 2 | 33.89% | 18.60% | 47.50% | 110 |
| | 3 | 14.92% | 12.51% | 72.58% | 12 |

|  | | Control Villages | | | |
|---|---|---|---|---|---|
|  | | Second Generation Income Category | | | |
|  | | 1 | 2 | 3 | N |
| First Generation Income Category | 1 | 82.83% | 8.49% | 8.68% | 131 |
| | 2 | 67.92% | 14.28% | 17.80% | 47 |
| | 3 | 48.17% | 18.79% | 33.04% | 0 |

*Note:* Computed using Ordered Logit Regressions.

middle-income families are more mobile and are roughly equally likely to move up or down.

These results vary considerably by treatment status, however. Second-generation children of low-income, schooled parents have a 70% chance of remaining in that category. Remarkably, their village counterparts whose parents were unschooled have only a 60% chance of remaining low-income. By contrast, individuals in control villages born to low-income first-generation parents are expected to remain low-income with a probability of 83%. Similarly, while the predicted probability of a second-generation individual born to middle-income parents moving upward is 41% for children of schooled parents and 48% for children of unschooled parents in villages with schools, it is only 18% for children born to parents from control villages. Finally, while the predicted odds of remaining high-income are 71% and 73% for second-generation children of schooled and unschooled parents in treatment villages, respectively, they are only 33% for children of parents from control villages (though no such children in the sample had high-income parents). The effects of having wealthy

first-generation parents are only pronounced in villages with schools.

**Table 6.1 D – Ordered Logit of First to Second Generation Income: Marginal Effects**

| VARIABLES | Category | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Individual-level treatment | -0.167*** | 0.00580** | 0.161*** |
| | (0.0251) | (0.00263) | (0.0244) |
| Village-level treatment | -0.269*** | 0.00936** | 0.260*** |
| | (0.0433) | (0.00385) | (0.0432) |
| Observations | | | 1978 |

*Note:* Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6.1 D quantifies the effects of first-generation wealth, individual-level treatment, and village-level treatment on second-generation wealth. The village-level treatment is associated with a 27% reduction in the probability that a second-generation individual is in the lowest wealth category. This effect is comparable in size to a one-unit increase in the wealth category of one's parents. The individual-level treatment is associated with a further 17% decrease in the likelihood that a second-generation individual ends up in the lowest wealth category.

## 6.2 Third generation

### 6.2.1 Education Mobility

Next, we examine education and income mobility between the second and third generations.

Table 6.2 E shows very high upward mobility from the second to third generations. We define an additional educational category for the third generation (4), which denotes graduate school. In the full sample, the rate of upward mobility in all categories is clearly much higher than it was between the first and second generations. The probability of attaining some education if your parents had none is 50%, and the probability of doing weakly better than your parents is between 50 and 70% for children of educated parents.

Again, results vary by treatment status. Third-generation individuals born to uneducated parents but educated grandparents have a 47% likelihood of getting no education, compared to 38% for grandchildren of uneducated grandparents in schooled villages and 71% for grandchildren

**Table 6.2 E – Transition Matrix, Education Outcomes from Second to Third Generation**

| | | Full Sample Third Generation Education Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | N |
| | 0 | 49.47% | 31.19% | 10.86% | 7.25% | 1.23% | 1048 |
| Second Generation | 1 | 30.16% | 34.62% | 17.86% | 14.62% | 2.74% | 628 |
| Education Category | 2 | 16.00% | 28.79% | 22.95% | 26.27% | 6.00% | 290 |
| | 3 | 7.75% | 18.60% | 21.73% | 39.28% | 12.64% | 76 |

| | | Treatment Villages: Treated Individuals Third Generation Education Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | N |
| | 0 | 47.14% | 31.14% | 10.64% | 9.74% | 1.34% | 294 |
| Second Generation | 1 | 30.40% | 33.44% | 15.88% | 17.59% | 2.69% | 57 |
| Education Category | 2 | 17.62% | 28.75% | 19.44% | 28.84% | 5.35% | 25 |
| | 3 | 9.48% | 20.26% | 18.78% | 41.12% | 10.35% | 2 |

| | | Treatment Villages: Untreated Individuals Third Generation Education Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | N |
| | 0 | 38.37% | 36.00% | 14.88% | 8.68% | 2.07% | 294 |
| Second Generation | 1 | 25.99% | 36.08% | 20.33% | 13.99% | 3.62% | 57 |
| Education Category | 2 | 16.53% | 31.46% | 24.53% | 21.24% | 6.24% | 25 |
| | 3 | 10.04% | 24.18% | 25.59% | 29.63% | 10.56% | 2 |

| | | Control Villages Third Generation Education Category | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | N |
| | 0 | 71.20% | 21.69% | 4.80% | 2.22% | 0.09% | 294 |
| Second Generation | 1 | 31.34% | 39.37% | 17.96% | 10.86% | 0.46% | 57 |
| Education Category | 2 | 7.78% | 23.06% | 28.28% | 38.44% | 2.45% | 25 |
| | 3 | 1.53% | 6.07% | 13.47% | 66.94% | 11.98% | 2 |

*Note:* Computed using Ordered Logit Regressions.

of grandparents in control villages. These effects are reversed for individuals born to university-educated parents, however. Such individuals have a 51% chance of receiving university education if their grandparents were schooled, versus 39% for grandchildren of those who lived in schooled villages but did not get educated, and 77% for those whose grandparents lived in control villages. These surprising results are qualified, however, by the small number of children whose parents received university education: only 76 in total, and a mere 2 of those whose grandparents lived in control villages.

The marginal effects of ordered logit models of education mobility between the second and third generations are presented in Table 6.2 F. Having a grandparent who lived in a schooled village decreases one's likelihood of receiving no education by 28% and increases one's likelihood of being college-educated by 15%. Interestingly, whether that grandparent actually went to the village school has no effect on third-generation education outcomes. As a whole, these results show

## Table 6.2 F – Ordered Logit of Second to Third Generation Education: Marginal Effects

| | Category | | | | |
|---|---|---|---|---|---|
| VARIABLES | 0 | 1 | 2 | 3 | 4 |
| I-level treatm. | 0.0137 | -0.00126 | -0.00470 | -0.0060 | -0.00146 |
| | (0.0232) | (0.00270) | (0.00798) | (0.0101) | (0.00249) |
| V-level treatm. | -0.277*** | 0.0315*** | 0.0951*** | 0.121*** | 0.0296*** |
| | (0.0261) | (0.00750) | (0.0106) | (0.0141) | (0.00560) |
| Observations | | | | | 1629 |

*Note:* Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

that shocks to first-generation human capital persist across generations, event apart from their transmission through the second generation.

### 6.2.2   Income Mobility

We now turn to income mobility between the second and third generations. We have created three categories of income for the second generation and three income categories for the third generation. We first present the transition matrix 6.2 G:

The results indicate significant income mobility from the second to the third generations in all income categories, vastly outpacing upward mobility from the first to second generations. This acceleration of upward mobility is consistent with arguments that independence substantially increased opportunities for citizens to improve their standards of living. Parents from the lowest income categories are 70% likely to place their children in higher income categories. Children of middle-income parents have a 56% chance to reach the top income category. 77% of children of upper-income parents remain in that category.

However, the results show substantial heterogeneity in upward mobility by first-generation treatment status. Among grandchildren of individuals in control villages, only 43% of those whose parents were low-income reach higher income categories. The corresponding rates for grandchildren of schooled grandparents and of unschooled but village-treated grandparents are 72% and 89%, respectively, showing a remarkable persistence in upward mobility for descendants of the "village-treatment" group. The table also reveals interesting disparities in the outcomes of middle-earners' children. As a whole, these children are overwhelmingly more likely to be upwardly than

**Table 6.2 G – Transition Matrix Wealth 2nd-3rd Gen.**

| | | Full Sample Third Generation Income Category | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | N |
| Second Generation Income Category | 1 | 30.63% | 36.88% | 32.49% | 870 |
| | 2 | 14.24% | 29.63% | 56.13% | 417 |
| | 3 | 5.88% | 16.83% | 77.29% | 727 |
| | | Treatment Village: Treated Individuals Third Generation Income Category | | | |
| | | 1 | 2 | 3 | N |
| Second Generation Income Category | 1 | 28.81% | 32.12% | 39.06% | 246 |
| | 2 | 11.72% | 22.13% | 66.15% | 108 |
| | 3 | 4.18% | 10.20% | 85.62% | 727 |
| | | Treatment Village: Untreated Individuals Third Generation Income Category | | | |
| | | 1 | 2 | 3 | N |
| Second Generation Income Category | 1 | 11.90% | 39.63% | 48.47% | 348 |
| | 2 | 7.68% | 31.87% | 60.45% | 246 |
| | 3 | 4.87% | 23.84% | 71.29% | 331 |
| | | Control Villages Third Generation Income Category | | | |
| | | 1 | 2 | 3 | N |
| Second Generation Income Category | 1 | 57.93% | 32.55% | 9.53% | 276 |
| | 2 | 37.67% | 42.98% | 19.34% | 63 |
| | 3 | 20.97% | 43.70% | 35.33% | 34 |

*Note:* Computed using Ordered Logit Regressions.

downwardly mobile, but these odds are reversed for grandchildren of control village grandparents. Even children of high-income parents have only a 35% chance of remaining high-income if their grandparents lived in control villages, versus a 71–86% chance for the two treatment groups.

Taken together, these results suggest that the rate of upward mobility for descendants of unschooled grandparents in villages with schools is higher than that of descendants of grandparents who went to school. The third-generation gap between treatment and control villages is far larger than that between descendants of schooled and unschooled grandfathers within treatment villages. This finding suggests that the effects of indirect externalities of shocks to human capital – for instance, through increases in aspiration (Wantchekon et al. 2015) – outpace the direct effects of such shocks on the people who receive them.

Table 6.2 H shows the reduced form effects of first-generation treatment on third-generation wealth. Children of grandparents in treatment villages massively benefit in their upward mobility, having a 40 percentage points higher probability of ending up in the highest wealth category. Interestingly, again, it does not seem to matter whether the grandparents were actually schooled

**Table 6.2 H – Ordered Logit of Second to Third Generation Income: Marginal Effects**

| VARIABLES | Category | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Individual-level treatment | -0.0230 | -0.0181 | 0.0411 |
| | (0.0125) | (0.0100) | (0.0225) |
| Village-level treatment | -0.263*** | -0.207*** | 0.407*** |
| | (0.0128) | (0.0135) | (0.0212) |
| Observations | | | 1978 |

*Note:* Robust standard errors are reported in parentheses. \* $p <$ 0.10, \*\* $p < 0.05$, \*\*\* $p < 0.01$

or not within villages having received the first schools.

Before moving on to the behavioral effects of mobility, we note that education and income mobility seem to be highly correlated. This seems to indicate a positive return to education. We explore this rigorously with a Mincerian regression that tests the association between income, education, and work experience.

Table A2 (in the Appendix) shows the returns to education by treatment status, using the income category from Section 6 as the dependent variable. The results show that a one-category increase in education is associated with a one-third category jump in income. Interestingly, the returns to education are over twice as large in the control as in the treatment villages. Plausibly, individuals with less education in control villages are worse off than those in treatment villages, as these individuals do not benefit from the local externalities of human capital shocks. These results suggest a greater inequality in control villages driven by differences in education.

In addition, we divide the sample into public and private sector workers (see Tables A3 and A4 in the Appendix). The results indicate that returns to education roughly double for private sector workers as opposed to public sector workers, again using the three-category wealth measure as the dependent variable. Furthermore, the returns to education are higher for private sector workers when they have at least a high-school education. For workers without a high-school education, however, the returns to education are higher for public sector workers. Thus, mobility would be greatly enhanced if an increase in high-school enrollment comes with an expansion of the private sector.

# 7 Behavioral Effects of Mobility

There is a growing literature on intergenerational mobility that examines the transmission of attitudes from parents to children. Altonji and Dunn (2000) find intergenerational persistence in work hours. Others focus on the transmission of charitable donations (Wilhem et al [2005]), preference for sons (Almond et al [2009]), or the preference of the son in terms of the marriage market (Fernandez et al [2004]). More recently, behavioral economists have examined the transmission of risk and trust attitudes across generations and estimated how parental risk aversion contributes to educational achievement of their descendants (Dohmen et al [2011]; Huebener [2015]; Zumbuehl et al. [2013]). These attitudes also correlate with contemporaneous wealth and social context (Guiso & Paiella 2008). Thus, there is growing evidence suggesting that risk attitudes contribute to social mobility and educational mobility.

In this section, we contribute to the literature on intergenerational transmission of risk attitudes by investigating the relationship between entrepreneurship in the first generation and various measures of risk aversion of the third generation. In contrast to other studies, we focus on the effect that mobility itself has on risk or trust attitudes, not the intergenerational transmission of these attitudes. Overall, we explore the way social mobility can facilitate individual behavioral capacity for development, such as risk and time preferences, and explain investment decisions, demand for education, or entrepreneurship. Our baseline specification provides correlations between behavioral outcomes and social mobility, controlling for gender, income, parents' entrepreneurship, and treatment. It reads as follows:

$$Y_i = \beta socmob_i + X_i'\gamma + \epsilon_i \tag{3}$$

where $Y_i$ corresponds to the behavioral outcomes, $socmob_i$ is the social mobility variable, and $X_i$ captures the controls including an intercept. The results of this specification are presented in Tables 7.0 A and 7.0 B.

While social mobility seems to correlate negatively with financial risk aversion, there is no significant relationship with social risk aversion when keeping the controls and treatment constant. Social mobility is furthermore associated with greater work ethic, self reliance, and life outlook,

while interestingly being negatively correlated with mental health.

### Table 7.0 A – Risk Aversion and Social Mobility

|                          | (1) Social Risk Aversion | (2) Financial Risk Aversion |
| ------------------------ | ------------------------ | --------------------------- |
| Social Mobility          | 0.00620                  | -0.0429*                    |
|                          | (0.0254)                 | (0.0256)                    |
| Gender                   | 0.0502                   | 0.0268                      |
|                          | (0.0498)                 | (0.0500)                    |
| Income                   | 0.0158                   | 0.0579*                     |
|                          | (0.0319)                 | (0.0329)                    |
| Entrepreneur             | 0.0925                   | -0.0978                     |
|                          | (0.0674)                 | (0.0729)                    |
| Individual-level Treatment | -0.128***              | -0.140***                   |
|                          | (0.0497)                 | (0.0506)                    |
| Village-level Treatment  | 0.360***                 | 0.199**                     |
|                          | (0.0779)                 | (0.0771)                    |
| Constant                 | -0.298***                | -0.125                      |
|                          | (0.0759)                 | (0.0772)                    |
| Observations             | 1887                     | 1941                        |

*Note:* The outcome variables are standardized average answers to a number of scale questions pertaining to social and financial risk aversion, respectively. Higher values mean greater risk aversion. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

These correlations are naturally not informative about the causal mechanisms we are interested in exploring. More socially mobile people are not only selected in ways correlated with the outcomes, but it is also quite plausible that there is strong reverse causation, in particular when we look at the relationship between social mobility and risk aversion. In addition, income is clearly an endogenous variable in this context. In fact, social mobility is defined as a function of own income and parents' income, and it is the bidirectional causation between income and risk aversion that drives the endogeneity of social mobility. We can conceptualize these issues in the following system of equations:

$$RA_i = \delta_1 inc_i + \delta_2 pRA_i + \delta_3 socmob_i + u_i \tag{4}$$

$$inc_i = \alpha_1 Treat_i + \alpha_2 pinc_i + \alpha_3 RA_i + v_i \tag{5}$$

where $socmob_i = f(inc_i, pinc_i)$ for some non-linear function $f$ that is given by the definition of our measure. The other variables are risk aversion ($RA_i$), income ($inc_i$), parents' risk aversion ($pRA_i$

<div align="center">

**Table 7.0 B – Attitudes and Social Mobility**

</div>

|  | (1) Time Preference | (2) Mental Health | (3) Work Ethic | (4) Self Reliance | (5) Life Outlook |
|---|---|---|---|---|---|
| Social Mobility | -0.0201 | -0.124*** | 0.0712*** | 0.0549** | 0.0549** |
|  | (0.0222) | (0.0277) | (0.0240) | (0.0235) | (0.0255) |
| Gender | 0.145*** | 0.0326 | -0.132*** | -0.121*** | -0.0358 |
|  | (0.0450) | (0.0596) | (0.0487) | (0.0466) | (0.0485) |
| Entrepreneur | -0.122** | -0.0221 | 0.00852 | 0.00349 | 0.0719 |
|  | (0.0487) | (0.0779) | (0.0643) | (0.0675) | (0.0702) |
| Income | -0.0554 | 0.228*** | -0.198*** | -0.213*** | -0.246*** |
|  | (0.0366) | (0.0415) | (0.0316) | (0.0325) | (0.0320) |
| Individual-level Treatment | 0.0452 | 0.217*** | 0.0205 | 0.100** | 0.119** |
|  | (0.0489) | (0.0590) | (0.0486) | (0.0479) | (0.0488) |
| Village-level Treatment | -0.0818 | 0.337*** | 0.0407 | 0.0125 | 0.170** |
|  | (0.0858) | (0.117) | (0.0764) | (0.0777) | (0.0732) |
| Constant | -0.0449 | -0.458*** | 0.0666 | 0.0560 | -0.137* |
|  | (0.0804) | (0.115) | (0.0744) | (0.0735) | (0.0730) |
| Observations | 1975 | 1155 | 1945 | 1950 | 1958 |

*Note:* The outcome variables are standardized factor analysis results using a number of questions pertaining to the respective outcomes. For all variables, a higher value means a better score for that outcome. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

as captured by parents' entrepreneurship), treatment ($Treat_i$), and parents' income ($pinc_i$).

We are interested in estimating the first equation (including gender as an additional control), which OLS is not able to do consistently for the provided endogeneity reasons. We therefore make use of the random assignment of school treatment and parents' income as an exogenous variable as instruments for social mobility and own income. Hence, our IV estimation specification is as follows:

$$Y_i = \beta_1^{IV} socmob_i + \beta_2^{IV} inc_i + X_i' \gamma^{IV} + e_i \tag{6}$$

where social mobility and income are instrumented as described, and $X_i$ includes the same controls as in the baseline specification 3 without income. The first stage is reported in Table 7.0 C, while the second stage results are shown in Tables 7.0 D and 7.0 E for risk aversion and attitudes, respectively.

The first stage for both instrumented variables is extremely strong. In terms of the results, we see that the negative relationship between social mobility and financial risk aversion is upheld.

**Table 7.0 C – IV First Stage**

|              | (1) Social Mobility | (2) Income |
|--------------|:---:|:---:|
| Treatment    | 0.342*** | 0.367*** |
|              | (0.0296) | (0.0292) |
| Gender       | -0.0670 | -0.129*** |
|              | (0.0441) | (0.0408) |
| Parents' Income | -0.583*** | 0.284*** |
|              | (0.0217) | (0.0200) |
| Entrepreneur | 0.348*** | 0.460*** |
|              | (0.0527) | (0.0473) |
| Constant     | -0.301*** | -0.349*** |
|              | (0.0509) | (0.0496) |
| N            | 1978 | 1978 |
| F            | 190.4 | 201.4 |

*Note:* Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

**Table 7.0 D – IV: Effect of Mobility on Risk Aversion**

|              | (1) Social Risk Aversion | (2) Financial Risk Aversion |
|--------------|:---:|:---:|
| Social Mobility | 0.0257 | -0.0922* |
|              | (0.0485) | (0.0525) |
| Income       | 0.167*** | 0.0688 |
|              | (0.0634) | (0.0653) |
| Gender       | 0.0641 | 0.0169 |
|              | (0.0519) | (0.0534) |
| Entrepreneur | 0.0280 | -0.0836 |
|              | (0.0799) | (0.0860) |
| Constant     | -0.0634 | -0.00666 |
|              | (0.0440) | (0.0448) |
| Observations | 1887 | 1941 |

*Note:* The outcome variables are standardized average answers to a number of scale questions pertaining to social and financial risk aversion, respectively. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

<div align="center">

**Table 7.0 E – IV: Effect of Mobility on Attitudes**

</div>

|  | (1) Time Preference | (2) Mental Health | (3) Self Reliance | (4) Work Ethic | (5) Life Outlook |
|---|---|---|---|---|---|
| Social Mobility | -0.0170 | 0.106 | 0.135*** | 0.117** | 0.212*** |
|  | (0.0546) | (0.0867) | (0.0473) | (0.0458) | (0.0488) |
| Income | -0.0723 | 0.761*** | -0.0974 | -0.146** | 0.0135 |
|  | (0.0665) | (0.104) | (0.0634) | (0.0634) | (0.0628) |
| Gender | 0.144*** | 0.0492 | -0.0972** | -0.119** | 0.0127 |
|  | (0.0485) | (0.0702) | (0.0489) | (0.0503) | (0.0532) |
| Entrepreneur | -0.120* | -0.383*** | -0.0755 | -0.0238 | -0.0889 |
|  | (0.0664) | (0.116) | (0.0796) | (0.0789) | (0.0821) |
| Constant | -0.0942** | -0.0815 | 0.0840** | 0.0974** | 0.00440 |
|  | (0.0384) | (0.0605) | (0.0405) | (0.0430) | (0.0454) |
| Observations | 1975 | 1155 | 1950 | 1945 | 1958 |

*Note:* The outcome variables are standardized factor analysis results using a number of questions pertaining to the respective outcomes. For all variables, a higher value means a better score for that outcome. Robust standard errors are reported in parentheses. $^*$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$

Increasing social mobility by one standard deviation reduces financial risk aversion by almost 0.1 standard deviations in the third generation. This is evidence in favour of our theory that improved development outcomes brought about by initial educational opportunities are sustained throughout several generations because of changes in risk attitudes. Even in the third generation, people seem to take over their parents' and grandparents' aspirations and are less risk averse in their financially related (and arguably income-generating) endeavours. The resulting income differences are well documented in the previous section.

Exploring a further set of attitudinal outcomes, we first note that the causal effect on mental health now seems to be positive, albeit insignificant. We do, however, observe that social mobility strongly and significantly improves self reliance, work ethic, and life outlook. These changes in attitudes are very much in line with the previous results of behavioral changes that are positively related with development outcomes.

# 8 Conclusion

This study estimates social mobility of the second- and third-generation descendants of the first elementary school students and their unschooled counterparts. We find evidence of upward mobility for both the second generation and the third generation. The evidence also suggests that education has a strong positive effect on intergenerational mobility. Interestingly, the effects mainly operate

at the village level. That is, descendants of those who were exposed to colonial education only through their social networks have, by and large, the same mobility outcomes as the ones of those who actually attended colonial schools and were educated. We interpret this as evidence for "the strength of weak ties" theory. Finally, we find that social mobility leads to lower financial risk aversion, more self reliance, better work ethic, and greater life outlook.

The paper is one of the first to provide a micro-level analysis of mobility in the developing world and to document how that mobility affects social-psychological attitudes and behaviors. As such, the paper makes an important contribution to the growing literature on the psychological effect of poverty by introducing an important dimension, movement in income and education from parents to children. In other words, the risk attitudes of the poor depend not only where he or she currently is, but also more whether she or he is moving up or down relative to his or her parents' income. For future research, we aim to further explore the long-term persistence of aspiration shocks and risk attitudes with mobility data from the fourth generation.

# References

**Aaronson, Daniel and Bhashkar Mazumder**, "Intergenerational Economic Mobility in the U.S., 1940 to 2000," *FRB Chicago Working Paper*, 2005, (2005-12).

**Alesina, Alberto, Stefanie Stnatcheva, and Edorado Teso**, "Intergenerational Mobility and Preferences for Redistribution," *Working Paper*, 2016.

**Benabou, Roland and Efe Ok**, "Social Mobility and the Demand for Redistribution: the POUM Hypothesis," *Qaurterly Journal of Economics*, 2001, *116*, 447–487.

**Black, Sandra E. and Paul J. Devereux**, "Recent developments in intergenerational mobility," *Handbook of Labor Economics*, 2011, *4*, 1487–1541.

**Breen, Richard and Christopher T. Whelan**, *Social mobility and social class in Ireland*, Gill and Macmillan, 1996.

_ **and Kristian Bernt Karlson**, "Education and social mobility: New analytical approaches," *European Sociological Review*, 2013.

**Case, Anne and Angus Deaton**, "Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century," *Proceedings of the National Academy of Sciences*, 2015. *Centenaire de l'Arrivee des Missionnaires au Pays Angolin*

***Centenaire de l'Arrivee des Missionnaires au Pays Angolin***, *1895-1995*.

**Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez**, *"Where is the land of opportunity? The geography of intergenerational mobility in the United States," National Bureau of Economic Research, 2014, (w19843).*

**Corak, Miles**, *"Income inequality, equality of opportunity, and intergenerational mobility," The Journal of Economic Perspectives, 2013, pp. 79–102.*

**D'Almeida, Topor Helene**, *Histoire Economique du Dahomey (1890-1920), Tome 1 et Tome 2, paris:editions l'harmattan ed. 1990.*

**Dupuis, Paul Henry**, *"Histoire de l'Eglise du Benin: Aube Nouvelle (Tome 2)," Lyon: Societes des Missions Africaines 1961.*

**Durlauf, Steve N. and Irina Shaorshadze**, *"Intergenerational Mobility," Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource, 2014.*

**Erikson, Robert and John H. Goldthorpe**, *The constant flux: A study of class mobility in industrial societies, Oxford University Press, USA, 1992.*

**Ferrie, Joseph, Catherine Massey, and Jonathan Rothbaum**, *"Do Grandparents and Great-Grandparents Matter? Multigenerational Mobility in the US, 1910-2013," Working Paper, 2016.*

**Grusky, David B. and Kim A. Weeden**, *"Does the sociological approach to studying social mobility have a future?," Mobility and Inequality: Frontiers of Research from Sociology and Economics, 2006, pp. 85–108.*

**Jenkins, Stephen**, *"Snapshots versus movies:'lifecycle biases' and the estimation of intergenerational earnings inheritance," European Economic Review, 1987, 31 (5), 1149–1158.*

**Krueger, Alan**, *"The Rise and Consequences of Inequality in the United States, presentation at the Center for American Progress in Washington, DC January 12, 2012," 2012.*

**Lipset, Seymour Martin and Reinhard Bendix**, *Social mobility in industrial society, Berkeley: University of California Press, 1959.*

**Loch, Dietmar and Ov Cristian Norocel**, *"The Populist Radical Right in Europe A Xenophobic Voice in the Global Economic Crisis," 2014.*

**Mazumder, Bhashkar**, *"Fortunate sons: New estimates of intergenerational mobility in the United States using social security earnings data," Review of Economics and Statistics, 2005, 87 (2), 235–255.*

**Mullainathan, Sendhil and Eldar Shafir**, *Scaracity: Why Having Too Little Means so Much, NY Henry Holt Times Books, 2013.*

**Piketty, Thomas**, *"Social mobility and redistributive politics," The Quarterly Journal of Economics, 1995, pp. 551–584.*

**Report, France Government**, *Gouvernment General de l'Afrique Occidentale Francaise, editions crete, corbeil(france) ed. 1906.*

**Tiikkaja, Sanna, Sven Sandin, Ninoa Malki, Bitte Modin, Pï¿$\frac{1}{2}$r Sparï¿$\frac{1}{2}$n, and Christina M. Hultman**, *"Social class, social mobility and risk of psychiatric disorder-a population-based longitudinal study," 2013.*

**Torche, Florencia**, *"Analyses of Intergenerational Mobility An Interdisciplinary Review," The ANNALS of the American Academy of Political and Social Science, 2015, 657 (1).*

**Wantchekon, Leonard**, *"Mobilite Sociale des Premiers Eleves du Benin (1864-1922)," Base de donnees, IREEP, Cotonou (Benin), 2012.*

_ , **Notva Natalija, and Klansja Marko**, *"Education and Human Capital Externalities: Evidence from Colonial Benin," Quarterly Journal of Economics, 2015, (130), 703–757.*

**Wilensky, Harold L. and Hugh Edwards**, *"The skidder: ideological adjustments of downward mobile workers," American Sociological Review, 1959, pp. 215–231.*

# APPENDIX

## Table A1 – Wage Scale by Occupation

Public Sector Employees with at Least High-School Education

| Occupation | N | mean | St. Dev. | min | max | Proportion in Income Scale 1 or 2 |
|---|---|---|---|---|---|---|
| Accountant / Manager / Cashier | 62 | 3.29 | 0.86 | 2 | 5 | 21.0 |
| Agricultural Engineer / Structural Engineer | 10 | 3.80 | 1.03 | 2 | 5 | 20.0 |
| Commercial Agent | 14 | 2.71 | 1.07 | 1 | 4 | 42.9 |
| Communicator / Journalist | 10 | 3.50 | 0.85 | 2 | 5 | 10.0 |
| Construction Industry/ Civil Engineering | 25 | 3.12 | 0.97 | 1 | 5 | 28.0 |
| Customs Officer | 2 | 3.50 | 0.71 | 3 | 4 | 0.0 |
| Dev Consultant | 9 | 3.44 | 1.51 | 1 | 5 | 33.3 |
| Diplomat | 1 | 5.00 | . | 5 | 5 | 0.0 |
| Doctor | 4 | 3.50 | 1.73 | 1 | 5 | 25.0 |
| Economist | 11 | 3.36 | 1.21 | 1 | 5 | 27.3 |
| Forester | 3 | 3.33 | 0.58 | 3 | 4 | 0.0 |
| Geographer | 2 | 3.00 | 1.41 | 2 | 4 | 50.0 |
| Hotelier | 8 | 2.63 | 1.41 | 1 | 5 | 50.0 |
| Lawyer | 6 | 3.67 | 0.52 | 3 | 4 | 0.0 |
| Magistrate | 3 | 3.33 | 1.15 | 2 | 4 | 33.3 |
| Microfinance Agent / Banker | 9 | 4.11 | 1.05 | 2 | 5 | 11.1 |
| Midwife | 13 | 2.69 | 0.75 | 1 | 4 | 30.8 |
| Nurse / Med School | 23 | 2.61 | 0.72 | 2 | 4 | 52.2 |
| Other | 2 | 1.50 | 0.71 | 1 | 2 | 100.0 |
| Priest / Religious | 11 | 1.73 | 0.90 | 1 | 4 | 90.9 |
| Professor | 23 | 3.09 | 0.85 | 1 | 4 | 21.7 |
| Unemployed | 531 | 1.15 | 0.53 | 1 | 5 | 97.6 |
| Radiologist / Dispensary Technician | 14 | 3.43 | 1.16 | 2 | 5 | 28.6 |
| Taxes Agent | 2 | 3.00 | 0.00 | 3 | 3 | 0.0 |
| Teacher | 139 | 2.80 | 0.78 | 1 | 4 | 30.9 |
| Veterinary / Logger / Framed | 10 | 3.30 | 0.95 | 2 | 5 | 20.0 |
| Total | 947 | 1.35 | 0.53 | 1 | 5 | 67.90 |

# Return to Education: Mincerian Regression

### Table A2 – Wealth returns by treatment status (Third Generation)

|  | (1) All | (2) Control | (3) Village | (4) Individual |
|---|---|---|---|---|
| Education | 0.290*** | 0.435*** | 0.161*** | 0.196*** |
|  | (19.92) | (10.03) | (9.03) | (8.51) |
| Age | 0.0259** | 0.00471 | 0.0254 | 0.0314 |
|  | (2.58) | (0.26) | (1.90) | (1.80) |
| $Age^2$ | -0.000277* | -0.000146 | -0.000275 | -0.000412* |
|  | (-2.54) | (-0.74) | (-1.87) | (-2.13) |
| Constant | 1.286*** | 1.003* | 1.779*** | 1.634*** |
|  | (5.74) | (2.43) | (5.99) | (4.22) |
| $N$ | 1506 | 310 | 704 | 492 |

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

### Table A3 – Public vs. Private Sector wealth returns (Third Generation)

|  | Private Wealth | Public Wealth |
|---|---|---|
| Education | 0.365*** | 0.188*** |
|  | (20.96) | (6.54) |
| Age | 0.0264 | 0.0275* |
|  | (1.65) | (2.23) |
| $Age^2$ | -0.000334 | -0.000241 |
|  | (-1.92) | (-1.83) |
| Constant | 1.070** | 1.458*** |
|  | (3.02) | (5.16) |
| $N$ | 712 | 794 |

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table A4 – Wage Returns by Sector and Education**

|  | (1)<br>Private HS | (2)<br>Public HS | (3)<br>Private No HS | (4)<br>Public No HS |
|---|---|---|---|---|
| Education | 0.637*** | 1.819*** | 0.679*** | 0.907*** |
|  | (5.37) | (4.00) | (7.31) | (13.50) |
| Age | 0.0903* | 0.0469 | 0.0904*** | 0.0633*** |
|  | (2.39) | (1.09) | (4.08) | (3.46) |
| $Age^2$ | -0.000489 | -0.000211 | -0.000841*** | -0.000561** |
|  | (-1.21) | (-0.44) | (-3.52) | (-2.98) |
| Constant | -2.300** | -5.314** | -1.382** | -1.327** |
|  | (-2.68) | (-3.15) | (-2.66) | (-2.89) |
| $N$ | 324 | 156 | 489 | 681 |

$t$ statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$