Inter-generational mobility in slums: Evidence from field surveys in Jakarta[*]

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Abstract

Slums are central to the global debate on inequality, serving as entry points for people moving to cities in search of economic opportunity. Yet, we know little about the extent of inter-generational mobility in slums due to a lack of data tracking families across generations (including family members who do not live together) as well as a lack of coverage of slums. This paper addresses these empirical challenges using field surveys of four slums in Jakarta, tracking educational mobility spanning three generations (grandparents, parents, and children). Amongst the grandparents who have less than primary education, only 24% of their children achieve junior secondary or more schooling. By contrast, for parents with less than primary education, 69% of their children have junior secondary or more schooling. Overall, the patterns suggest improvements in educational mobility across generations. There is suggestive evidence that groups with high educational mobility also exhibit high occupational mobility.

JEL Classifications: O180, R200

Keywords: Inter-generational mobility, slums, urbanization

I. Introduction

The United Nations estimates that one billion people, close to a third of the world's urban population, live in slums. Slums are at the heart of the global debate over income inequality. They serve as entry points for many people moving to cities in search of economic opportunity. Slums are also often characterized by poor living conditions, raising concerns that they represent poverty traps that impede upward mobility.

Yet, we know surprisingly little about the extent of inter-generational economic mobility in slums (see Marx, Stoker, and Suri (2013) for a review of the literature on slums). There are three major data constraints. First, most datasets do not have indicators to identify slum locations and the ones that do often have geographic units that are too coarse. As a result, these datasets may not be covering enough slum residents. A second constraint is a lack of data spanning multiple generations. Third, there is also limited information about family members who do not co-reside together anymore because most surveys only ask about demographic information for people living in the same residence.

This paper addresses the empirical challenges using field surveys of four slums in Jakarta to study inter-generational educational mobility. The survey includes 160 households (664 individuals) and was conducted in 2016 in four centrally located slums in Jakarta. The survey includes information about education and occupation spanning three generations (grandparents, parents, and children). Importantly, the sample includes information for grandparents and children who do not reside together with the household head.

I use several methods to characterize inter-generational educational mobility in these four slums. The primary metrics rely on transition matrices and conditional transition probabilities (Bhattacharya and Mazumder (2011)). I focus on transitions from less than primary schooling to junior secondary and beyond, conditioning on different sub-groups (such as earlier versus later cohorts, migrants versus natives, males versus females). While it is descriptive and not meant to be causal, the comparisons across subgroups highlight where the potential barriers to mobility might be.

Next, I estimate inter-generational elasticities in years of schooling. The elasticities are not easily comparable across sub-groups as they capture the rate of regression to the sub-group means. I also report the means in the survey for the different sub-groups, with faster convergence towards a higher sub-group mean suggestive of greater mobility. Following Hertz et al. (2007), I also report inter-generational correlations, which capture "standardized persistence", as the correlations standardize schooling outcomes by the standard deviation of schooling for each generation. Standardizing can be important for developing countries that experienced dramatic secular improvements in education outcomes.

Overall, I find large improvements in educational mobility across generations. The conditional transition probabilities are the easiest to compare across sub-groups. For example, amongst the grandparents who have less than primary education, only 24% of their children achieve junior secondary or more schooling. By contrast, amongst the parents who have less than primary education, 69% of their children have junior secondary or more schooling. When comparing natives born in Jakarta and migrants born elsewhere, I find that natives have slightly greater mobility (47% transition probability for natives versus 38% for migrants).

Turning to estimates of inter-generational elasticities, the overall elasticity for years of schooling is 0.27, implying that educational disparities are smaller amongst the children of more versus less educated parents. Interestingly, the inter-generational elasticity for education has been halved from older generations (0.4 for grandparents and parents) to younger generations (0.17 for parents and children). In addition, average schooling has also increased across the generations (from 8 years to 11 years). Together, these findings point to greater mobility towards a higher mean in the younger cohorts relative to the older cohorts. Looking across subgroups, I find larger elasticities for migrants (relative to natives who were born in Jakarta), with both groups having similar means.

The improvements in educational mobility in these slums echo broader improvements in schooling attainment in Indonesia, mitigating concerns that slums are trapped in a low human capital equilibrium. According to the World Bank, primary school completion rates exceeded 95% by 1985 and junior secondary completion rates increased from 69% in 2002 to 81% in 2013. These

patterns are consistent with schooling policies that have expanded access to education, including a nation-wide program to build schools in the 1970's (Duflo (2001)), a large-scale slum upgrading program in Jakarta in the 1970's and 1980's (Harari and Wong (2018)), as well as compulsory schooling policies.

Next, I investigate labor market outcomes to examine whether the robust patterns for educational mobility translate readily to occupational mobility. I measure the likelihood of transitioning from low income occupations (farmers, cleaners, laborers) to high income occupations (retail, administrative, teachers, police). There is less variation across the sub-groups with respect to occupational mobility. Interestingly, cohort pairs exhibiting above median educational mobility have a 48% chance of transitioning from low to high income occupations, relative to a 36% chance for cohort pairs with below median educational mobility. When respondents were asked why they do not have a formal sector job, 21% reported that they did not have adequate schooling and 11% reported they lacked the necessary skills or experience, pointing to the importance of education in the mobility process.

Finally, I explore the extent to which these four centrally located slums provide access to occupations with high incomes. Interestingly, 34% of males (63% of females) work at home or in the neighborhood while 47% of males (35% of females) work in the town center. Incomes for workers in the town center are 49% greater compared to residents working in slums, even after controlling for gender, education, experience, and occupation. The concentration of work in slums in spite of the large disparities in income are suggestive of barriers to labor market access for slum residents.

While the survey data addresses concerns related to the coverage of slum residents and bias due to co-residency, one important caveat is its generalizability beyond the sample. Ideally, it would be useful to have a nationally representative sample that identifies slum residents and tracks them across generations, regardless of residency. In addition, it would also be important to track mobility over time to assess bias from endogenous sorting.

This paper is related to a small but growing literature on economic well-being in slums, which has its roots in seminal work by Lewis (1954) and Harris and Todaro (1970). Field (2007) studies a

large titling program in Peru, Cavalcanti, Mata, and Santos (2017) models the formation of slums, Cattaneo et al. (2009) examines the impact of improving housing conditions in Mexico on child health and adult happiness, Feler and Henderson (2011) studies the provision of local services in Brazil, Barnhardt, Field, and Pande (Forthcoming) investigates a slum relocation program in India. Moreover, a related line of research examines urban development and slums. For example, Marx, Stoker, and Suri (2015) focuses on ethnic patronage and private investments in slums in Kenya, Henderson, Venables, and Regan (2016) models the dynamic development process of slums in Kenya, Harari and Wong (2018) examines slum upgrading in Indonesia, Michaels et al. (2018) studies sites and services programs in slums in Tanzania.

There is limited work on inter-generational mobility in low income countries, especially for slums. Krishna (2013) investigates economic mobility in slums in Bangalore but does not examine educational mobility. Hertz et al. (2007) reports inter-generational elasticities in schooling for 42 countries, including low and high income countries, such as the United States (0.46), Norway (0.40), Switzerland (0.49), Bangladesh (0.58), Chile (0.64), South Africa (0.69), Ghana (0.71), Colombia (0.80). Using survey data from 2000, they estimate an inter-generational elasticity of 0.78 for Indonesia. This estimate is not directly comparable given the different population means. In particular, the lower elasticity for slums in this paper (0.27) does not indicate more mobility in these four slums.

The rest of the paper proceeds as follows. Section 2 provides background of Indonesia and the four slums. Section 3 describes the data. Section 4 presents the empirical framework. Section 5 presents the results. Section 6 concludes.

II.   Background

Indonesia is the fourth most populous country in the world with around 250 million people and GDP per capita of US$3,500. The city of Jakarta has a population of 10 million, and is part of a larger metropolitan region with more than 30 million people. The poverty rate is 12% in 2012

(World Bank (2014)).

By many measures, Indonesians have achieved significant improvements in education attainment in the past few decades, as discussed in the Introduction. The government introduced compulsory primary education (6 years) in 1950, which was later extended to junior secondary (9 years) in 1994, and high school (12 years) in 2013. Historically, the government has tended to prioritize education, with more than 20% of the government's budget committed to education. Besides compulsory schooling policies, the government also embarked on a large school construction program in the 1970's. In Jakarta, slum upgrading programs have also expanded access to schools.

The urban sector is rapidly growing in importance in Indonesia. According to the World Bank, Indonesian cities are growing faster than other Asian countries. Slightly more than half of the population live in cities with more than two thirds expected by 2025. Of the 21 million jobs created between 2001 to 2011, 18 million were in urban areas and 17 million were in the service sector (Lewis (2014)).

The slums in the field survey are centrally located. On average, workers spend 27 minutes commuting to work, which is remarkably short given traffic congestion in Jakarta. Their jobs are an average of 7 kilometers from their homes. The high concentration of residents working in slums is consistent with Field (2007), which finds that providing titles substantially shifts labor supply away from work at home. In the sample, only 15% of households report having a title and more than 60% report being anxious that they may be evicted by the landlord and the government.

In addition, these slums have relatively good access to local services. As many as 94% of households report having access to electricity and 79% report having their own latrines. Households also report being satisfied with access to health services, education, electricity, and water.

While the slums are centrally located, not all of the residents are able to access formal sector jobs in the town center. 34% of males (63% of females) work at home or in the neighborhood. 47% of males and 35% of females work in the town center. 9% of males work in factories in industrial centers. The rest do not have permanent locations (many are food vendors or in the service sector). Those who work in the neighborhood are mostly sellers, laborers, or providers of transportation

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services. Those who work in the town center are part of retail establishments, restaurants, or have administrative jobs. About 22% are self-employed (without employees) and 13% have employees.

III. Data

The main data source is a field survey of four slums in Jakarta. I conducted the field survey in 2016, as part of a broader project with Mariaflavia (Nina) Harari on urban development patterns in Jakarta. The sample comprises 160 households (664 individuals). While there are several administrative surveys in Indonesia, the main difficulty is identifying slum residents. For example, the Indonesian Family Life Survey (IFLS) includes rich individual information, but only asks whether the *kelurahan* (urban village) has a slum, which is likely too coarse for Jakarta.[1]

The sampling strategy was as follows. The enumerators were told to visit four localities in Jakarta. Within each locality, the team identified *Rukun Warga* (hamlets, an administrative unit below localities) that have slums, according to local officials. They then selected one hamlet randomly. Next, they identified the *Rukun Tetangga* (sub-hamlets) that have slums and randomly selected two sub-hamlets. Finally, they randomly selected 20 households from each sub-hamlet. In total, the sample has 160 households.

Table 1 reports summary statistics for 160 household heads in the survey, compared to all of Jakarta.[2] The average age of the household head is 49 years, slightly above the average for Jakarta (45). 81% of the household heads in the survey are male and 48% are born in Jakarta (compared to 85% and 58% respectively for Jakarta). The average household size is 5.0, compared to 4.1 for Jakarta. The average years of schooling is 7.2 years, relative to 10 years for Jakarta. Moreover, only 24% have completed high school and 4% have completed tertiary education, compared to

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[1]There are around 260 administrative localities in Jakarta. A locality is an important administrative unit where land transactions are recorded and public services are provided. Localities are akin to urban villages with the average locality having an area of 2.5 square kilometers and 10 hamlets. Since not all hamlets in a locality are slums, it is too coarse to identify slums at the locality level.

[2]The statistics for Jakarta were largely calculated from the 2008 *Susenas* (a nationally representative household survey). Except, the indicator for whether the household head was born in Jakarta was obtained from the 2010 population census. I do not use the IFLS because it only covers 13 of the 27 provinces in Indonesia.

51% and 10% in Jakarta. The average annual household income is US$3,500 in the slum sample, relative to a gross regional product per capita of US$14,000 for Jakarta (BPS (2016)).

To track educational mobility, the survey includes information on schooling attainment for all members residing in that household. Crucially, the survey also asks about the education and occupation of the oldest child, second oldest child, and the parents of the household head, regardless of their residencies. For the inter-generational linkages, I primarily consider two cohort pairs (household heads and their children plus household heads and their parents).[3] I drop individuals who have not completed their schooling yet, keeping those aged 18 and above.[4] The primary estimation sample for educational mobility includes 333 cohort pairs.

Table 2 presents average schooling attainment for the three generations (grandparents, parents, and children). For grandparents, 47% have less than primary and 37% have primary education only. For the parents, 45% have achieved junior secondary and beyond. For the youngest cohort (children), 53% have achieved high school and 10% have college and beyond. On average, the grandparent cohort has 5 years of education, the parents have 8 years, and the children have 11 years of schooling.

Aside from education, the survey also includes information about labor market outcomes for the top two income earners in the household, including information on occupation, place of work, and monthly income. Traditional occupation categories in some administrative surveys have tended to focus on agricultural occupations, and may miss many occupations that are common in slums (these tend to be related to service or retail sectors, with many being self-employed). For the field survey, respondents were asked to describe their occupations, and I categorized their descriptions. The three most common occupations (comprising slightly more than half of the occupations) are sellers, drivers, and construction workers or contractors. To examine inter-generational mobility in occupations, the survey also enquires about occupations for children and grandparents who are not co-residing. The sample for occupational mobility includes 292 cohort pairs with non-

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[3]The results are similar if I include the spouses of the household heads and their children, but I do not have information for the parents of the spouses.
[4]The results are similar if I restrict the minimum age to 25.

missing occupation information (Section V.B.1.). Finally, I also examine labor market access for 248 working individuals (Section V.B.2.).

IV. Empirical framework

The empirical analysis focuses on inter-generational mobility in education. Relative to estimating mobility in permanent income, there are fewer empirical challenges for educational mobility. First, measurement error is less of a concern for schooling whereas measurement error in earnings could lead to attenuation bias for income mobility estimates. Also, individuals tend to complete their education early in their lifetime, so there is less of a lifecycle bias, unlike earnings which can change significantly throughout the lifecycle. Finally, there is less of a selection concern with schooling in Indonesia as the educational attainment rates are high, unlike unemployment rates .

I present three measures of educational mobility. The main measure of mobility will comprise transitional probabilities, which are easy to interpret and to compare across sub-groups. I present transition matrices across discrete categories of educational attainment. In particular, for sub-groups, I report conditional transition probabilities (Bhattacharya and Mazumder (2011)), focusing on the transition from below primary (for the older cohort) to junior secondary and beyond (for the children). As Indonesia has had near universal primary completion rates since the 1980's, there is relatively less variation in primary attainment rates. I report 95% confidence intervals for the estimates, obtained from bootstrapping over 100 iterations.

Second, I present estimates of inter-generational elasticities:

$$ln(s_c) = \alpha + \beta ln(s_p) + \varepsilon \tag{1}$$

where s_c is years of schooling for the child, s_p is schooling for the child's parent, ε is an idiosyncratic error term. The unit of analysis is a pair of cohorts (grandparents-parents, parents-children). The estimation sample has 333 parent-child pairs. Standard errors are clustered at the household level.

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The parameter of interest is β, the inter-generational elasticity for schooling. It measures differences in outcomes between children of more versus less educated parents with $1 - \beta$ corresponding to educational mobility. β also captures the rate of regression to the population mean, which is different across the sub-groups. The estimating equation implies that the data generation process for s_c is characterized by the rate of convergence and the mean. For example, finding greater mobility towards a lower mean may not necessarily indicate an improvement .

For the third metric, following Hertz et al. (2007), I present estimates of inter-generational correlations for education. As shown below, the correlation (ρ) is obtained by multiplying the elasticity by the ratio of the standard deviations for parents (σ_p) and for children (σ_c).

$$\rho = \frac{\sigma_p}{\sigma_c} \beta \tag{2}$$

This metric effectively standardizes educational attainment by the standard deviation for each generation to account for secular changes in education across generations. For example, an overall expansion in schooling over time (like what Indonesia experienced) could increase the variance in schooling for younger cohorts. In this case, the inter-generational correlation would be lower than the elasticity, indicating weaker (standardized) persistence . For example, Hertz et al. (2007) estimate that the inter-generational elasticity in education is 0.58 for Viet Nam, but the correlation is only 0.40. Moreover, they find inter-generational elasticities declined steadily over time for Asia, but correlations remain stable. This indicates that much of the educational mobility improvements captured by the decline in inter-generational elasticities is driven by differences in the overall dispersion in educational attainment.

There are several empirical threats to estimating inter-generational mobility in education. First, most surveys only collect information for households that co-reside together. In the data, I find more mobility when including cohort pairs that are living together only. This is consistent with the more upwardly mobile child living with and supporting the parents. Moreover, only 15% of the household heads are co-residing with their parents so conditioning on co-residence excludes many grandparents.

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Another important concern is entry and exit of slum residents. To the extent that upwardly mobile residents are more likely to have left the slums and less mobile residents stay in slums, the estimated effect will tend to under-estimate inter-generational mobility. By contrast, if less successful migrants leave the slums, I would be over-estimating mobility. Residents in the survey are not very mobile. The five-year mobility rate is less than 6% and the average length of stay is 24 years. Finally, an important concern is external validity as the four slums in the sample are centrally located and have higher quality amenities.

V. Results

V.A. Educational mobility

I begin by presenting the overall transition matrix of educational mobility. Table 3 represents a transition matrix across five categories of educational attainment, including less than primary, primary, junior secondary, secondary, and tertiary. The rows represent children's schooling and the columns correspond to parents. Each column sums to 100%.

The mass is clearly concentrated below the diagonal, consistent with educational mobility. For example, while 44% of parents have not completed primary education (column 1), 32% of their children have completed primary education, 14% have completed junior secondary, and 28% have completed secondary and beyond. Column 2 shows that amongst the older cohort who have completed primary (35% of the sample), 69% of their children completed education beyond primary schools.

Next, Panel A of Table 4 presents conditional transition probabilities across sub-groups. I focus on the transition from below primary to junior secondary and above. The brackets below present 95% confidence intervals from bootstrapping. Column 1 shows that for parents who have not completed primary education, 42% of their children have completed at least junior secondary (this corresponds to the last three rows in column 1 in the previous table). Notably, this transition probability is higher (78%) if we condition on cohort pairs who co-reside in slums. The

co-residing sample excludes working children who have their own households (they tend to ex-hibit lower mobility) as well as grandparents, who also tend to be associated with lower mobility. Indeed, columns 2 and 3 show strong improvements in upward mobility from the earlier cohorts (grandparent-parent) to the later cohorts (parent-child). If the grandparents have less than primary education, only 24% of the parents have junior secondary and beyond. However, if the parents have below primary schooling, 69% of the children have junior secondary schooling.

All these parents were born in the slum. It would be a concern if a large fraction of the parents sorted into these centrally located slums in search of mobility for their children. Since the parents did not choose to locate in the slums, this is reassuring that the 69% estimate is unlikely to be driven by endogenous sorting in (of course, endogenously exits remain potentially concerning). This upward educational mobility pattern is consistent with the expansion of compulsory schooling through junior secondary in 1994. Columns 4 and 5 show slightly greater mobility for natives born in Jakarta (47%) compared to migrants born outside Jakarta (38%), although their confidence intervals overlap. Finally, the last two columns show a greater probability of upward mobility for females than males.

Panel B of Table 4 presents inter-generational elasticities with respect to educational achieve-ment. Panel C presents inter-generational correlations (with p-values in the brackets). Column 1 reports an inter-generational elasticity of 0.27 and a correlation of 0.28, suggesting that educational disparities are smaller in the younger cohort, even after accounting for differences in dispersion across generations.

To probe the extent to which inter-generational persistence is driven by family versus environ-mental contexts, I follow the framework developed in Solon (1999) which relates sibling corre-lations with inter-generational elasticities . In this model of human capital formation, schooling depends on inter-generational transmissions within the family and neighborhood effects. Under some assumptions, the sibling correlation depends on the squared of the inter-generational elastic-ity, where $\rho_{siblings} = \beta^2 + u$, and u corresponds to non-parental determinants of education (such as neighborhood effects). In the survey, the sibling correlation is 0.5. Using the elasticity estimate

of 0.27 implies that up to 15% of the sibling correlation is driven by parental effects, with a large share left to be explained by other factors.

Next, I explore heterogeneity in inter-generational elasticities across sub-groups. These sub-sample estimates measure mobility and regression to sub-sample means. While they are not readily comparable to the estimate in column 1, it is nonetheless instructive to assess the degree of heterogeneity across sub-groups. I report the sub-sample means of the dependent variable (years of schooling of the young cohort) at the bottom row of Panel B.

Overall, the patterns are similar to those of the conditional transition matrix. Column 2 restricts to the older generations (grandparents-parents) and column 3 only examines the parent-child pair. The elasticity is more than twice as large for older generations (0.40), relative to the younger generations (0.17). While the elasticities are not directly comparable across sub-groups in general, in this case, since the mean is *higher* for the younger generations (11 years of schooling versus 8), finding faster regression to a higher mean for younger generations is suggestive of an improvement in educational mobility. Panel B shows that the differences are smaller using correlations (0.36 versus 0.24). While this is not necessarily a causal estimate of the effect of slums on upward mobility, it is consistent with compulsory and universal education, as well as slum upgrading programs in Jakarta improving educational access for younger cohorts. The changes in estimates across sub-groups are large and consistent with trends estimated by Hertz et al. (2007). They estimate the elasticity fell by 0.04 units every five years for Indonesia (about 0.2 every 25 years). The remaining columns show greater persistence for migrants (0.37) than for natives (0.15) and for males (0.37) than females (0.08 and insignificant). The means are similar for the different sub-groups, suggesting greater mobility for natives and males.

Next, Table 5 present educational mobility estimates using the 2008 *Susenas* (a nationally representative survey). The benefit of Susenas is that it is nationally representative, but the limitation is that it only collects schooling for individuals that live together.[5] Nonetheless, it is instructive

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[5]For example, Susenas surveys may be undercounting grandparent-parent cohort pairs which are not co-residing and these pairs tend to exhibit lower mobility (as discussed above). Thus, this co-residency bias would over-estimate transition probabilities.

to examine education mobility in the national sample. Panel A reports the conditional transition probabilities for all households (column 1), urban only (column 2), and rural only (column 3). The overall transition probability is 57%, greater than that for the slum survey (46%). Individuals in urban settings report greater mobility (69%), compared to the rural areas (54%), and the residents in the slum survey. Panel B shows similar elasticities in the urban and rural samples, but the urban sample has a higher mean (9 years compared to 7 years for rural). As discussed above, conditioning on co-residence in the slum sample increases the transitional probability to 78%, which is much greater than the rural sample. In addition, the sub-group mean is also greater for co-residents in slums (11 years) than the rural sample (7 years). These patterns are suggestive of greater mobility amongst slum residents in the sample, relative to the rural sector, albeit with a limited sample size for the slum sample (93 cohort pairs who are co-residing).

V.B. Labor market access

Overall, the findings above are consistent with improvements in educational mobility across generations, mitigating concerns about slums as poverty traps with low human capital formation. Next, I examine labor market outcomes for slum residents.

V.B.1. Occupational mobility

I first explore occupational mobility by ranking occupations by income (see, for example, Abramitzky, Boustan, and Eriksson (2014)). For the top two primary income earners for each household, I have information on their occupations and monthly income, which I use to rank occupations by income. I classified their occupations into aggregate categories based on the respondents' descriptions of the jobs. The highest incomes are associated with jobs in the public sector and independent sellers (around 3 million rupiahs, US$222); followed closely by jobs in the formal retail sector (around 2.9 million rupiah); administrative and managerial jobs, including banks and financial services (2.6 million rupiah). The lower income occupations include jobs in factories and security officers (around 2 million rupiah), construction (1.7 million rupiah), service

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sector jobs, including cleaners (1 million rupiah). The most common jobs are in retail, with 27% working as independent sellers (food vendors and kiosks) and 13% working in the formal retail sector (such as shopping centers). I classify the first four types of jobs (public sector, sellers, formal retail, administrative) as high income occupations (the average income is above 2 million, the median in the sample). The conclusions are similar using other cutoffs to define high versus low income occupations.

Table 6 presents conditional probabilities of transitioning from low income to high income occupations. In contrast to educational mobility, the patterns for occupational mobility are less robust. As discussed above, the occupational mobility estimates are less sharp and tend to be subjected to greater measurement error, lifecycle bias, and selection due to unemploynment . Nevertheless, education appears to be important. When I split the sample by educational mobility (bottom panel), I find a greater transition probability (48%) for cohort pairs with high educational mobility (the children have above median education and the parents have below median education), relative to those with low educational mobility (36%).

V.B.2. Slums and labor market access

There is a large literature examining the role of places in shaping labor market opportunities (Cutler and Glaeser (1997); Kling, Liebman, and Katz (2007); Chetty, Hendren, and Katz (2015)). The centralized locations of slums may provide access to jobs and employment networks for workers. For example, Barnhardt, Field, and Pande (Forthcoming) examine a housing lottery in India that resettled slum dwellers to the city's periphery, finding that winners report improved housing but no change in family income or human capital. This is consistent with the notion that slums in centralized locations can provide access to jobs and employment networks. In the data, fewer than 30% of workers report finding a job by themselves, using ads, or through an employment agency. A majority relied on friends and family to help them find a job. 34% of employers required a reference or recommendation and 24% of employers required a background check.

Table 7 explores the relationship between income and the place of work for slum residents.

The dependent variable is log of monthly income (mean of 2.5 million rupiah, US$193). Column 1 includes only four dummies for places of work. Column 2 adds demographic controls, including gender, years of schooling, experience, and its squared. Column 3 adds occupation dummies, and two self-employment dummies (self-employed with and without employees). Standard errors are clustered at the household level.

Column 1 indicates that income is 65% higher in the town center and 55% in industrial centers, relative to the omitted group (working at home or in the neighborhood). These significant differences remain after controlling for demographics and occupation fixed effects. The coefficients in column 2 are smaller but still substantial and significant, reflecting the notion that those who work in the town center and industrial center tend to be male and more educated. Controlling for gender reduces both coefficients by around 10 percentage points, and further controlling for years of schooling reduces both coefficients by an additional 10 percentage points. Column 3 shows that the results are robust to adding occupation controls. These large disparities in income by place of work, coupled with the high concentration of work in slums (particularly for women) point to potential barriers to labor market access for some slum residents.

Table 8 investigates compositional differences, by comparing demographic characteristics by the place of work. Column 1 shows that workers in the industrial sector and in the town center are 38% and 22% more likely to be male, respectively. Column 2 shows that those working in the industrial and town center have 2 and 2.6 more years of schooling. Column 3 shows that high school completion appears to be more important for accessing jobs in the town center. Column 4 shows that Javanese (the major ethnic group in Jakarta) are more likely to work in the industrial sector.

These demographic patterns characterize who works where and which sub-groups face larger barriers to accessing high income jobs in town centers and industrial centers. The large gender disparities suggest relatively larger potential gains from improving access for women. For example, Attanasio, Kugler, and Meghir (2011) and Attanasio et al. (Forthcoming) find a vocational training program in Colombia helps women gain access to formal sector jobs. The probability of paid

employment increases by close to 7%, hours per week by almost 3 hours, and wages by close to 20%.

VI.   Conclusion

This paper provides novel estimates of inter-generational educational mobility using field surveys of four slums in Jakarta, shedding new light on the potential for upward mobility in slums. I find significant improvements in educational mobility across cohorts and relatively greater mobility for natives than for migrants. Turning to occupational mobility, the patterns are less robust, but the estimates suggest groups with high educational mobility also exhibit high occupational mobility.

The patterns for educational and occupational mobility suggest that improvements in educational attainment do not readily translate to occupational gains for everyone. To probe the issue of labor market access further, I document where slum residents work and which jobs provide greater incomes. I find that many report working in slums (especially women), in spite of potentially large income gains for those working in nearby town centers. These findings suggest potential barriers to labor market access for certain groups of slum residents.

There are several caveats and directions for future research. One important limitation of the field survey is the potential generalizability. Therefore, it would be interesting to explore a larger sample with a wider geographic scope, including other slums and non-slum areas. Another direction for future research is to explore other notions of social mobility, including income and relative mobility in economic ranks. Finally, it would be interesting to study the role of policies in accelerating economic mobility, including compulsory schooling laws, school construction, and slum upgrading programs that expand access to schooling.

Tables

Table 1: Demographics for the field survey and for Jakarta

Variable	Jakarta	Slums (Field survey)				
	mean	mean	sd	p25	p50	p75
Age	45	49	13	40	49	58
Male	0.85	0.81	0.40	1	1	1
Born in Jakarta	0.58	0.48	0.50	0	0	1
Household size	4.1	5.0	2.3	4	5	6
Years of schooling	10.0	7.2	3.9	3	6	9
Completed high school	0.51	0.24	0.43	0	0	0
Completed college	0.10	0.04	0.19	0	0	0

Notes: Summary statistics for household heads in two different samples. Column 1 corresponds to statistics for Jakarta computed from the 2008 Susenas households survey. The subsequent columns report data for 160 household heads in the field survey. The statistic for whether the household head was born in Jakarta is obtained from the 2010 population census (this variable is not available in the 2008 Susenas).

Table 2: Schooling attainment across generations

Education:	<Primary	Primary	Jun. Secondary	High School	College+	Total
	%	%	%	%	%	%
Grandparents	47	37	9	6	1	100
Parents	25	30	21	20	4	100
Children	5	15	17	53	10	100

Table 3: Transition matrix for educational attainment

	Parent's Education				
Child's Education	1	2	3	4	5
	%	%	%	%	%
1	26	8	4	0	17
2	32	23	15	11	0
3	14	25	17	11	0
4	25	35	56	67	33
5	3	9	8	11	50
Total	100	100	100	100	100

Notes: The five categories of educational attainment are less than primary, primary, junior secondary, high school, and tertiary. Each cell reports the percent of children with educational attainment (row), conditional on parental educational attainment (column).

Table 4: Inter-generational educational mobility in slums

Dep. var.	**ln(Child's education)**						
Sample	All	Grandparents	Parents	Migrants	Jakarta natives	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Conditional transition probability							
ln(Parents's education)	0.42	0.24	0.69	0.38	0.47	0.31	0.54
	[0.28,0.56]	[0.08,0.40]	[0.46,0.93]	[0.18,0.58]	[0.26,0.68]	[0.13,0.49]	[0.22,0.85]
Panel B: Inter-generational elasticity							
ln(Parents's Education)	0.27***	0.40***	0.17**	0.37***	0.15	0.37***	0.08
	(0.06)	(0.10)	(0.06)	(0.08)	(0.09)	(0.08)	(0.09)
N	333	170	163	175	158	229	104
R^2	0.08	0.13	0.06	0.13	0.03	0.14	0.01
Mean	9.6	8.3	10.8	9.5	9.6	9.5	9.6
Panel C: Inter-generational correlation							
ln(Parent's education)	0.28	0.36	0.24	0.36	0.16	0.41	0.14
	[0.00]	[0.00]	[0.002]	[0.00]	[0.04]	[0.00]	[0.24]

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Notes: The unit of analysis is a pair of generations (grandparents-parents and parents-children). The dependent variable is log of years of schooling for the children and the regressor is log of years of schooling for the parents. Column 1 includes 333 pairs with non-missing information on educational attainment. Column 2 includes grandparents-parents only and column 3 includes parents-children only. Column 4 includes migrants and column 5 includes Jakarta natives. Columns 6 and 7 split the sample by gender. Panel A reports conditional transition probabilities (less than primary to junior secondary and beyond), with 95% confidence intervals in the brackets, obtained from bootstrapping. Panel B reports inter-generational elasticities with standard errors clustered by household. Panel C reports inter-generational correlations with p-values in brackets.

Table 5: Inter-generational educational mobility, 2008 national sample

Dep. var.	**Child's education**		
Sample	All	Urban	Rural
	(1)	(2)	(3)
Panel A: Conditional transition probability			
ln(Parent's education)	0.57	0.69	0.54
	[0.53,0.62]	[0.63,0.75]	[0.49,0.58]
Panel B: Inter-generational elasticity			
ln(Parent's education)	0.33***	0.28***	0.27***
	(0.003)	(0.004)	(0.004)
N	665332	250949	414383
R^2	0.17	0.17	0.09
Mean	8.0	9.3	6.9

* p<0.1, ** p<0.05, *** p<0.01

Notes: Educational mobility using a 2008 national household survey. Panel A reports conditional transition probabilities with 95% confidence intervals in the brackets, obtained from bootstrapping. Panel B presents inter-generational elasticities with standard errors clustered at the household level.

Table 6: Inter-generational occupational mobility

Sample	All	Grandparents	Parents	Migrants	Jakarta natives
	(1)	(2)	(3)	(4)	(5)
High occupation jobs	0.40	0.40	0.43	0.41	0.40
	[0.19,0.62]	[0.16,0.63]	[0.05,0.81]	[0.11,0.71]	[0.09,0.70]
N	292	203	89	149	143

Sample		Low EdMobility	High EdMobility	Males	Females
High occupation jobs		0.36	0.48	0.38	0.48
		[0.10,0.62]	[0.16,0.81]	[0.15,0.62]	[0.17,0.78]
N		185	107	218	74

* p<0.1, ** p<0.05, *** p<0.01

Notes: The unit of analysis is a pair of generations (grandparents-parents and parents-children). Similar to conditional transition probabilities reported in Panel A of the Table 4 with 95% confidence intervals in the brackets, obtained from bootstrapping. The sample only includes cohort pairs with non-missing occupation information. High income occupations (average monthly income above 2 million rupiahs) include jobs in the formal retail sector, administrative/office jobs (banks, managers), jobs in the public sector (teachers, police), and sellers. Low income occupations include the service sector, drivers, security officers, factory jobs, construction and laborers, cleaners, farmers, and homemakers. The transition probabilities present the likelihood of transitioning from low- to high-income occupations. The first two columns in the bottom panel splits the sample by high education mobility households (households where the older cohort's education was below median and the younger cohort's education was above median) and low education mobility households. The last two columns split the sample by the gender of the child.

Table 7: Income and place of work

Dep. var.	ln(Income)		
	(1)	(2)	(3)
Industrial	0.55**	0.32*	0.51**
	(0.18)	(0.15)	(0.17)
Town	0.65***	0.43***	0.49***
	(0.13)	(0.12)	(0.12)
Not permanent	0.31	-0.03	0.06
	(0.18)	(0.19)	(0.24)
Other	0.72*	0.48	-0.02
	(0.30)	(0.35)	(0.34)
N	248	248	248
R^2	0.11	0.24	0.46
Demographics	N	Y	Y
Occupation	N	N	Y
Self-employed	N	N	Y

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Notes: The dependent variable is log of income for the two primary income earners in each household, winsorized at the top 1%. The four key regressors are dummies for the place of work, relative to working at home or in the neighborhood. Column 2 adds demographic controls (gender, years of schooling, experience and its squared). Column 3 controls for occupation fixed effects and also two indicators for self-employed (with and without employees). Standard errors clustered by household are reported in parentheses.

Table 8: Demographics and place of work

	Male	Years of schooling	High school	Javanese
	(1)	(2)	(3)	(4)
Industrial	0.38*	1.99	0.13	0.32*
	(0.16)	(1.11)	(0.16)	(0.14)
Town	0.23***	2.60***	0.35***	-0.04
	(0.07)	(0.52)	(0.06)	(0.06)
Not permanent	0.57***	0.47	0.00	0.14
	(0.04)	(0.78)	(0.12)	(0.14)
Other	0.57***	0.43	-0.03	0.08
	(0.04)	(1.13)	(0.18)	(0.22)
N	248	248	248	248
R^2	0.11	0.11	0.12	0.03
Mean	0.60	8.60	0.38	0.32

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Notes: Repeats column 1 of Table 7 but with demographics as the dependent variable, instead of income.

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