# Does Climbing the Jobs Ladder Promote Poverty Reduction?

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## Abstract

This paper explores trends in and the potential determinants of the types of jobs held by workers, and their relationship with poverty reduction, in an unbalanced panel of 89 countries over the past 30 years. Jobs are classified into five categories according to formality, occupation or level of skills required, and wage work versus self-employment. Net shifts into "upper tier" or skilled informal wage jobs, defined as professionals, managers, technicians, or clerks, from "lower tier" or lower skilled informal jobs were strongly associated with poverty reduction at the $1.90 and $3.20 lines. In contrast, net shifts into formal wage jobs from lower tier informal jobs were associated with modest poverty reductions at the $5.50 poverty line. The share of workers in informal upper tier jobs represents less than 2 percent of the workforce and has increased little over the past 30 years in low- and middle-income countries. The findings show that increases in upper tier informal wage jobs are associated with shifts of the workforce from microenterprises to small firms in lower- and upper-middle-income countries, but they are not discernibly associated with higher educational attainment or urbanization. In contrast, increases in the share of formal wage jobs are strongly associated with increases in the share of workers with post-secondary education, driven by high-income countries. The results suggest that upper tier informal wage jobs and the skills they require play a potentially important role in poverty reduction but are not automatically generated by increased educational attainment, urbanization, or firm size.

# Does Climbing the Jobs Ladder Promote Poverty Reduction?[1]

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# Introduction

Ever since Lewis's (1954) seminal paper, economists have remained interested in the process of labor reallocation throughout the development process. Although Lewis was careful not to put it in such terms, it is clear that his paper is describing the movement of labor from the agriculture sector to the non-agriculture sector, a process now commonly referred to as structural transformation. Indeed, many papers have followed this line of reasoning, clearly documenting the differences in productivity and wages between the agriculture and non-agriculture sectors (Gollin et al., 2014; McCullough, 2017). However, the reallocation process itself is much more complex, as more productive firms exist in both sectors, as do less remunerative forms of employment. A case in point for the latter is the large number of workers in low-paid non-agricultural self-employment, especially among younger adults in African cities (Fox et al., 2016, Cunningham et al 2024) and in the service sector (Rodrik, 2016, Nayyar et al. 2021). A review of existing evidence on the sectoral wage gaps and labor market dynamics points to the presence of frictions that hinder worker reallocations to growing and more productive sectors (Donovan and Schoolman 2023).

Along with ideas about the evolution of labor across sectors, there was also a prediction that labor would move from the informal sector to the formal sector as countries developed, under the assumption that formal employment is more productive than its informal counterparts (John, 1970; Rauch, 1991). Yet, this prediction has largely failed to materialize in much of the developing world, even in countries with high growth rates, like India (Kanbur, 2017). While debates continue about the long-term prospects of the informal sector (see, for example, de Soto (2000) and Levy (2010) for competing views), a key fact has emerged: the informal sector remains

an important contributor to the economies of many countries, with informality contributing up to 30 to 70 percent in most low- and middle-income countries and accounting for up to 80 percent of the workforce and an equally large share of firms (Ulyssean 2020). In Africa, for instance, every 8 out of 10 people work informally (ILO, 2018).

Informal workers are heterogeneous, ranging from subsistence farmers, urban street vendors, own account workers, contributing family members in household enterprises at the lower end of the distribution, to entrepreneurs and technical workers or professionals with high potential, who voluntarily choose to remain informal (non-registered), at the upper end (Poschke 2010; Schoar 2010, Banerjee and Duflo 2011). Existing studies document substantial heterogeneity in the informal sector, although the exact shares of different types of workers remain unknown. Gindling and Newhouse (2014) find that while own-account workers tend to be less educated than formal workers, nearly one in three own-account workers shares similar characteristics as employers and over 60 percent fall in the middle or high tercile of per capita household consumption, suggesting potential to progress up the jobs ladder. Similar heterogeneity is apparent when examining informality in Sub-Saharan Africa (Cunningham et al 2024). On the other hand, as noted by Jayachandran (2021), other studies find that some workers prefer self-employment, which can also attract high-ability entrepreneurs (Falco and Haywood, 2016, Blattman and Dercon 2018.). Therefore, some may select informality by choice ("exit") while others are involuntarily excluded ("exclusion") (Perry et al. 2007, Maloney 2004). The extent to which the informal sector is characterized by exit versus exclusion is still debated, with Fields (2019) claiming that most self-employed workers are involuntarily excluded from wage jobs.

Besides the prevalence of voluntary exit in the informal sector, other important questions regarding informality remain unanswered (Ulyssea 2023). For example, does informality work as a stepping-stone for entrepreneurs with high-growth potential but who might be constrained by, say, credit constraints? From the workers' perspective, especially young and female workers, do informal jobs represent a stepping-stone to better, formal jobs or are they a dead-end that makes transitions into formal employment very unlikely? For informal workers that choose to be informal, what determines their choice? Does climbing the jobs ladder promote poverty reduction?

The existing literature examining workers' mobility within and across informal and formal jobs finds that informality is persistent among informal unskilled jobs. For example, relying on a rotating panel of labor force surveys for about 50 countries, Donovan et al. (2023) find that transitions in and out of employment and across job types are more common in developing countries than developed countries. The short-term transitions captured in the data tend to show churning between low-earning wage work, informal self-employment, and unemployment rather than progression up the jobs ladder. This is consistent with lack of qualifications, policy failures, and labor market frictions preventing large shares of informal workers from persistently moving to better paid jobs. Using panel data from Ghana, South Africa, Tanzania, and Uganda, Danquah et al. 2021 provide evidence that lower tier informal self-employment is often a dead end persistently locking in a situation of inferior pay and conditions, while informal wage jobs can be a stepping-stone into formal employment relationships, especially for those in the more dynamic upper-tier segment. In Ukraine, informal wage employment has been used as a stepping-stone to enter formal wage employment and is not voluntarily chosen (Lehman and Pignatti 2018).

Regarding the cross-country analysis of drivers of poverty reduction, the literature on productivity growth points to the large contribution of the growth of unskilled labor-intensive sectors such as agriculture, construction, and manufacturing to reduce poverty (Loayza and Raddatz 2010). This is corroborated by Erumban and de Vries (2024), who find poverty-reducing impacts of productivity growth in agriculture in Africa and Asia, as well as manufacturing growth in Asia. However, these studies consider productivity growth rather than employment patterns. Within countries, poverty falls when workers move from the agriculture sector in rural areas to non-agricultural work in secondary cities, rather than mega cities (Christiaensen and Todo 2014).

While these studies are helpful, a complete understanding of the determinants and consequences of informality would benefit from systematic analysis of linked data on informal workers and production units, which is rarely available (Elgin et al, 2021).

In this paper, we explore global trends in formal and informal employment aggregates and the extent to which aggregate labor reallocations are associated with changes in workers and country-level characteristics. Specifically, we focus on three key questions: (1) How did formal and informal labor employment shares evolve over the past 30 years? (2) How were national changes in the employment structure during this time associated with poverty reduction? And (3) Which country characteristics were associated with progression into better paid jobs, especially those leading to higher poverty reduction?

While there is no standard way to define informality among the self-employed and wage workers, we use a modified version of the "jobs ladder" taxonomy introduced by Fields et al. (2023) differentiating informal jobs based on (1) the extent to which informal jobs are free entry, meaning they do not require specific skills, land and capital (we call them "lower-tier") as

opposed to restricted entry informal jobs requiring some forms of human, physical, and financial capital ("upper tier"); and (2) employment status, differentiating between wage-employment and self-employment, each with possible different working conditions and compensation mechanisms. We group employment into five separate categories: formal wage employment, upper-tier self-employment,[2] upper-tier informal wage employment, lower-tier informal self-employment and lower-tier informal wage employment,[3] as well as the non-employment categories of unemployment and non-labor force participation. We leverage the World Bank Global Jobs Indicators Database (JOIN) to operationalize the above definition and generate country level indicators, drawing on household surveys and labor force surveys harmonized in the World Bank Global Labor Database (GLD), the Global Monitoring Database (GMD) and the International Income Distribution Database (I2D2). Based on the data we have, we cannot say much about the informality of firms, rather the dimension of informality that is captured is from the worker's perspective. Our upper tier self-employment category is an approximate measure of informal firms.

We document changes in labor allocations across 89 countries over 30 years, based on aggregate statistics at the country level by gender, age groups, urban-rural and education attainment from a total of almost 493 surveys (Table A2). Drawing on country level analysis this paper documents correlations rather than individual level transitions along the rungs of the job ladder. Overall, approximately a third of people aged 15 and above are in lower tier informal jobs, while 20 percent of adults are in formal wage employment; less than 6 percent of people

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[2] Informality of self-employment is very difficult to define consistently across countries. Very few LFS and household surveys collect information on business registration for tax purposes among the self-employed.
[3] See Table 1 for definitions of each category.

are in upper self-employment or upper informal wage employment. The upper tier self-employed have the highest earnings,[4] higher than those of formal wage workers, which are almost double those of lower-tier informal workers (Table A3).

At first glance, formal wage employment has increased on average in the past 30 years, especially since the turn of the century. However, a closer examination shows that this increase is driven mostly by high-income countries and is more pronounced among men; low- and middle-income countries saw relatively small, if any, increases in formal wage employment. The four informal jobs categories do not show a consistent trend. When looking at labor reallocations within groups of workers by their education level, we see no significant change nor increase in formal and upper tier informal jobs. However, we note that this is partly driven by the fact that education increased markedly across all countries; over time, the number of individuals with low education decreased while the number of individuals with higher levels of education increased. As a result, the increase in formal wage jobs, which was particularly rapid in high-income countries, was due to increases in the share of more educated workers rather than increases in formal jobs for workers in specific education categories.

Second, we estimate how changes in job categories correlate with changes in (country-level) poverty rates. We have three key findings. Most importantly, growth in high-tier *informal* wage employment relative to lower-tier self-employment is strongly correlated with lower levels of headcount poverty at the $1.90 and $3.20 lines. Importantly, however, we are unable to distinguish between informal *firms* and informal *employment*. In other words, it could be the case

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[4] Conditional on surveys (309) collecting information on earnings for both wage workers and self-employed. It is important to note that depending on survey design and implementation, some profits may have been reported by some self-employed.

that formal firms are hiring informally, which would be consistent with previous research (La Porta & Shleifer, 2014). Second, net shifts from lower tier self-employment to unemployment are associated with a smaller increase in poverty at the $1.90 and $3.20 rate, although only the latter is statistically significant. This suggests that increases in unemployment may slow poverty reduction. Finally, increased formal wage work is associated with a modest decline in poverty at the $5.50 line, while informal wage employment is not, suggesting that the benefits of increased formal wage work are not enjoyed by the poorest workers. Overall, these results suggest that net shifts from lower-tier self-employment to informal upper tier wage work are strongly associated with poverty reduction.

Third, we look at what country characteristics (in terms of factor endowments and employment structure by economic sector, geographical area and firm size) are associated with labor reallocations to pro-poor informal upper tier jobs and formal wage jobs. We find that improvements in higher education are strongly associated with shifts out of informal lower tier jobs to formal wage jobs, while improvements in basic education levels are not statistically significant when controlling for country fixed effects and GDP per capita. We find evidence that firm size is important for improvements up the job ladder, but not necessarily as important as education and as in the same ways as in previous research. Previous research has found that smaller firms are important drivers of job creation (Ayyagari et al., 2014). In contrast, we find that firm size is not discernibly correlated with an increased share of workers in formal wage employment, conditional on GDP growth. However, increases in the share of workers employed in small firms (with 6 to 20 employees) as opposed to micro-enterprises (0-5 employees) are significantly correlated with both increases in upper-tier informal wage employment and

8

informal lower-tier jobs. An increase in larger firms, defined as more than 20 employees, is also associated with a shift out of lower-tier self-employment into formal wage work, though the latter is only marginally statistically significant. Increases in large firms are less strongly associated with changes in job type. Increases in employment in any of these firms is associated with increased labor-force participation, though it is only significant for the firms with between 21 and 50 employees, while the coefficient for the smallest category is half the size of the larger categories. The results lend some support to the notion that firm size and wages may not be as strongly correlated in services-based economies as in manufacturing-based economies (Berlingieri et al., 2018), which is particularly relevant in light of the literature on "premature deindustrialization" (Rodrik, 2016). In addition, we do not have information on firm age, which is an important mediator (Lagakos et al., 2018).

Finally, the results do not show strong and significant correlations between urbanization and movement up the job ladder to formal and informal upper tier jobs, while labor reallocations from agriculture to manufacturing are associated with increases in formal wage employment. Similarly, we do not find significant correlations between improvements in the jobs ladder and openness to trade, and capital deepening measures. There is also no clear relationship between educational attainment, urbanization, or firm size and net shifts into the informal upper-tier wage jobs that are most conducive to poverty reduction. Overall, these results fail to reveal a clear pattern between the country characteristics considered and increases in the formal and informal upper tier jobs. This suggests that further research could be useful to better understand the country-level conditions that promote growth in the types of jobs most conducive to poverty reduction.

## 2. Data and Methods

This section gives an overview of the data we use as well as the methods employed throughout the rest of the paper.

### 2.1 Data

The data include household surveys and labor force surveys harmonized in the World Bank GLD, GMD and I2D2 collections and then curated in the Jobs Indicators Database (JOIN). JOIN draws on labor force surveys and household surveys from many different countries over the last five decades. In this paper, we restrict the time period to between 1990 and 2021, and to surveys that have all the information to generate our five jobs categories which results in 493 surveys across 89 different countries. The number drops to 458 surveys and 72 countries when education variables are considered. The data come from many regions of the world, with a particularly large sample coming from Latin America. Note that countries with a single survey drop out of regressions with country fixed effects, so we code them as having no surveys in the map. We discuss this more below.

In some regressions, we include macro indicators, many of which are only available from 2000 onwards, therefore reducing the number of surveys (country-year). We list the variable sources in Table A1 in the appendix. The firm size variables we use in some analyses come directly from the labor force surveys. The inclusion of the macro variables drops our sample size to 395 different surveys in some of the empirical analyses. Table A2 in the appendix lists the number of surveys we have across years, by country income[5] and region, in our final sample.

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[5] In some of our empirical results, we break out countries by income status. We define income s
tatus such that it does not change for any given country in our entire sample, based on the income classification of the country for the year the first survey is available in our sample.

## 2.2 Descriptive statistics

Our main goal is to analyze changes in the types of jobs held by workers across different countries over the last three decades. We classify employees based on their job type and formality status, adapting the definitions used by Fields et al. (2023). Table 1 lists the five different "rungs" on the jobs ladder, which ranges from lower-tier informal wage employees (lowest) to upper-tier self-employed (highest) based on median hourly wage and earnings as criteria to rank the five job categories.

Table 1: Definitions of Rungs on Jobs Ladder

| | |
|---|---|
| 1. Upper-tier self-employed | Self-employed professionals, managers, technicians, or clerks OR employers with at least one employee. |
| 2. Formal wage employees | Wage employees with social security, health insurance, or a contract. |
| 3. Upper-tier informal wage employees | Non-formal wage employees who are professionals, managers, clerks, or technical employees. |
| 4. Lower-tier informal wage employees | Non-formal wage employees who are neither professional, managers, clerks, or technical employees and unpaid workers. |
| 5. Lower-tier informal self-employed | Self-employed who have no paid employees, and are not professional, managers, clerks, or technical workers. |

To provide supporting evidence regarding the ordering of rungs, Table A3 in the appendix shows the median wage and earnings in our sample, by the rung of the ladder on which an employee is placed. Upper tier self-employed have the highest earnings, higher than formal wage workers, therefore the ordering of job status in terms of earnings has upper tier self-employed at the top. It has to be noted that when other monetary benefits (health insurance and other social security benefits) and non-monetary benefits (job security and having a written contract for example) are considered, formal wage work may be considered at the top of a jobs ladder. Self-employment rungs would be preferred and ranked at the top of the ladder when the

independence and flexibility of work arrangements are used as the main ranking criteria. What

is clear is that lower-tier informal wage employees and self-employed receive the lowest median

remuneration, validating the tier classification.

Over all countries, one in three people of working age is engaged in lower tier informal

jobs, compared to 20 percent of people in formal wage jobs, 6 percent in upper tier informal jobs,

5 percent in unemployment and 38 percent who are inactive. Lower-tier informal wage jobs and

self-employment yield the lowest earnings and account for most jobs in lower income countries

(accounting for 48 percent of the working age population in LICs as opposed to 31 percent in

LMICs, 21 percent in UMICs and 13 percent in HICs). Table A4, also in the appendix, presents a

breakdown of the proportion of adults (15+) in each category, by income status and by region.

There is a clear increase in the proportion of workers in higher forms of employment as country

income increases; 37.3 percent of adults in high-income countries are classified as formal wage

employees, while just 10.2 percent of adults in low-income countries are classified as such.


## 2.3 Methods

We collapse all labor data to the country-survey year level, using the provided survey

weights. We reweight the data in two ways. Our preferred specification gives each country equal

weight and reweights the data to correct for heteroskedasticity driven by the number of

observations in the sample surveys. We calculate the average number of survey observations for

each country, Ih we denote as $\bar{N}_c$. Putting these together, our final weight for each country-year

is $\frac{\bar{N}_c}{N_c}$, where $N_c$ is the number of survey waves for country $c$. Giving each country equal weight

avoids skewing the results towards countries with more frequent surveys. Meanwhile, correcting

for heteroskedasticity gives greater weight to countries with larger surveys, since the labor outcomes are estimated more precisely in these countries. This forms the data for the descriptive changes of the job ladder indicators across years. However, in the appendix we also report key results without the heteroskedasticity correction, to verify that they are robust (Table A17-A19) without heteroscedasticity.

We also estimate linear regressions of different forms. The simplest form is used to estimate trends in the share of workers in different rungs:

(1) $$Rung_{c,t} = \alpha_c + \beta D(t) + \varepsilon_{ct},$$

where $Rung(c,t)$ is the proportion of adults (15+) on a given rung of the ladder in country $c$ in year $t$, $\alpha_c$ is country fixed effects, and $D(t) = \frac{t}{10}$ , so that the coefficient $\beta$ represents the average change in the share of workers working in a particular rung over ten years.

To assess whether changes in the jobs ladder are correlated with changes in poverty. We estimate regressions of the form:

(2) $$Poverty_{ctl} = \alpha_c + \delta_t + \sum_{r=2}^{r=7} \gamma_r Rung_{rct} + \beta_1 X_{c,t} + \beta_2 GDP_{c,t} + \beta_3 Pop_{c,t} + \varepsilon_{ct},$$

where $Poverty_{ctl}$ is headcount poverty in country $c$ at time $t$, measured at poverty line l. We conside three separate poverty lines, set at $1.90, $3.20, and $5.50 in PPP 2011 terms. These correspond to the extreme poverty line, and the poverty line for lower-middle-income countrie and upper- middle-income countries. $Rung_{rct}$ is the proportion of adults on rung $r$, with the proportion of people in lower-tier self-employment being the omitted category. We also include the unemployed and those out of the labor force, leading to seven total categories. In all regressions, we cluster standard errors at the country level.

Finally, to better understand the determinants of net changes in the share of workers in each rung, we estimate the following equation:

(3) $$Rung_{c,t} = \alpha_c + \delta_t + \beta_1 X_{c,t} + \beta_2 GDP_{c,t} + \beta_3 Pop_{c,t} + \varepsilon_{ct},$$

where $Rung(c,t)$ is the proportion of adults (15+) on a given rung of the ladder in country $c$ in year $t$, $\alpha_c$ is country fixed effects, $\delta_t$ is year fixed effects, $GDP_{c,t}$ is log per capita GDP in country c and year t, $Pop_{c,t}$ is log population in country c and year t and $\varepsilon_{ct}$ is an error term. $X(c,t)$ includes variables of interest. In the simplest specifications, $X(c,t)$ includes just the numeric year, indicating a linear time trend, and we exclude the year fixed effects. Other specifications include different types of variables of interest. For example, in one specification, $X(c,t)$ includes the proportion of people with a secondary degree and the proportion of people with more than a secondary degree in country $c$ in year $t$, as well as GDP per capita and total population, both logged.

## 3. Results

In this section, we report the main results. We attempt to answer three separate questions, based on the three equations listed in the previous section: (1) What is the evolution of job ladder categories over time? (2) How are changes in the jobs ladder associated with growth and poverty reduction? And (3) What characteristics are associated with progression up the ladder and with poverty reducing jobs? We go through these three questions in turn in the following subsections.

14

## 3.1 What is the evolution of job ladder categories over time?

We begin with a simple graphical representation of changes in different job categories, across the entire sample, in Figure 1. We take 2000-2004 as the base period and estimate regressions with country fixed effects. The figure plots the resulting coefficients for different time periods, relative to 2000-2004. Several patterns jump out. First, there is a clear increase in formal wage employment; the proportion of workers in formal wage employment increased by around eight percentage points from 2000-2004 to 2015 or later. Since on average only 20 percent of working age people is classified as formal wage employees, eight percentage points is a relatively large increase. The second clear pattern is a decrease in both inactivity (i.e. more people in the labor force) and unemployment. Other categories show no clear patterns, with some years seeing increases and others decreases, though by 2015, both lower-tier self-employment and lower-tier informal wage employment see decreases of around 1.5-to-2 percentage points.

Figure 1: Changes in job categories over time
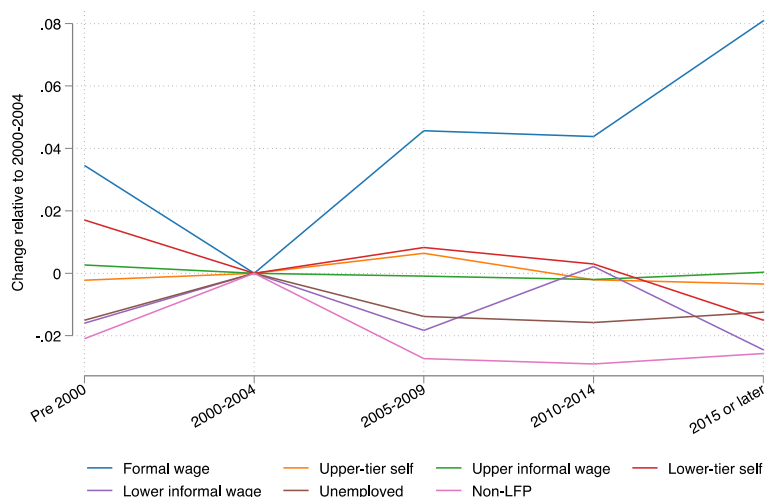


Notes. The figure shows coefficients from a regression with country fixed effects. 2000-2004 is the base time period, meaning changes are measured relative to 2000-2004. "Non-LFP" refers to the share of people aged 15 and above who are inactive, i.e. out of the labor force. Unemployed refers to the share of people aged 15 and above who are unemployed. The five job rungs refer to the shares of workers aged 15 and above in each job rung.

15

Table A5 in the appendix shows average changes by decade in the sample, based on separate regressions – one for each category – with country fixed effects. Formal wage employment increased by around 3.7 percentage points per decade, while lower-tier informal wage employment decreased by around 1.5 percentage points per decade. We are unable to come to any firm conclusions about changes in other categories due to uncertainty of the estimates, though we note that the magnitude of all other coefficients is less than one percentage point per decade.

Figure 2 - Trends by country income
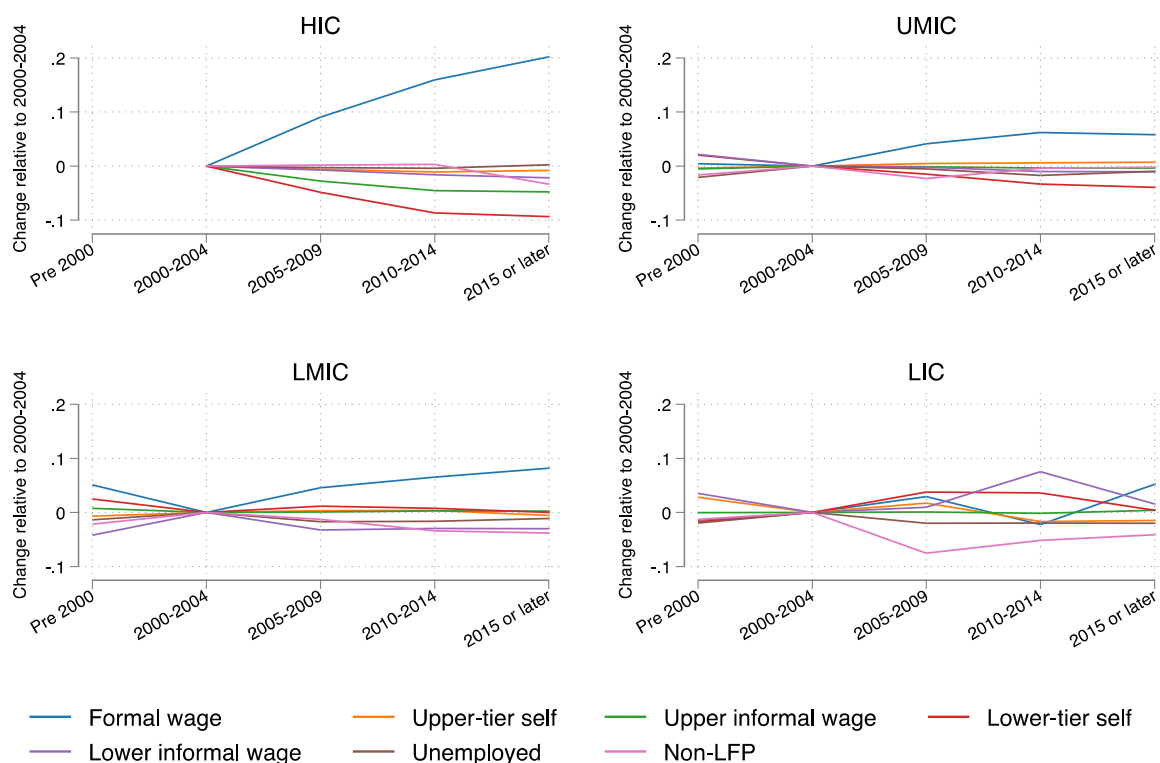


Notes. Points are coefficients from regressions with country and year fixed effects, with 2000-2004 being the base year for all income categories. The country income group classification is based on the year the country enters the sample for the first time and is kept constant throughout the period. High-income countries (HIC) have very few observations prior to 2000, leading to no coefficient for that time period.

Figure 2 presents changes by country income group graphically. We use each country's initial income status throughout the entire sample period, so that changes are driven only by changes within country and not by changing income status. The figure makes clear that the increase in formal wage employment was driven primarily by high-income countries; middle- and low-income countries saw relatively small changes. We break out these changes empirically in Table 2. The coefficients, derived from equation (1), are directly interpretable as the average change, per decade, for each income status.

Upper tier self-employment which is at the top of the earning ladder does not have a clear pattern overall countries offsetting small decreases in all countries except in UMICs where it increased by 0.5 percent per decade. While we see clear increases in formal wage employment throughout our sample, this increase was driven by high-income countries; formal wage employment in these countries increased by 15.4 percentage points per decade, on average. The two middle-income categories saw small increases in formal wage employment of 2.7 and 3.4 percentage points per decade. The coefficient for low-income-countries is around twice as large as that for upper-middle-income countries, but the standard errors are much larger, meaning that the coefficient is not statistically significant. What is clear, however, is that decreases in all other ladder rungs are only clear in high-income countries.

Table 2: Changes in job categories by country income

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Year 10s | -0.008*** | 0.154** | -0.038** | -0.076** | -0.017*** | -0.000 | -0.015*** |
| (in HIC) | (0.001) | (0.029) | (0.009) | (0.017) | (0.002) | (0.000) | (0.000) |
| Year 10s | 0.005** | 0.027*** | -0.001 | -0.026*** | -0.011** | -0.000 | 0.006 |
| (in UMIC) | (0.002) | (0.005) | (0.001) | (0.005) | (0.005) | (0.007) | (0.005) |
| Year 10s | -0.001 | 0.034*** | -0.001 | -0.010 | -0.004 | -0.002 | -0.016 |
| (in LMIC) | (0.003) | (0.011) | (0.002) | (0.008) | (0.003) | (0.003) | (0.015) |
| Year 10s | -0.021* | 0.052 | 0.002 | -0.010 | -0.015 | -0.003 | -0.005 |
| (in LIC) | (0.011) | (0.057) | (0.004) | (0.020) | (0.038) | (0.006) | (0.026) |
| Observations | 493 | 493 | 493 | 493 | 493 | 493 | 493 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country fixed effects are included in all regressions. Coefficients are marginal effects, not interaction terms, meaning the coefficients are directly interpretable as the average change for each income status. The country income classification is fixed based on the income classification of the country for the year the first survey is available.  * p<0.10 ** p<0.05 *** p<0.01.

Which region showed the largest increases in formal wage employment? Figure 3 answers this question graphically. The largest increases for formal wage employment happened in East Asia and the Pacific (in our sample, Australia and the Republic of Korea dominate this increase), followed by Europe and Central Asia and Latin America and the Caribbean. Sub-Saharan Africa saw increases, but much more modest. The only clear decrease was in the Middle East and North Africa. Figure A2 in the appendix shows changes by gender and Figure A3 shows changes by age group graphically. The empirical results for gender are in Table A6 and A7 in the appendix.  Overall results are generally similar, with the largest differences being labor force participation status. The empirical results for age groups are in table A8, A9 and A10. Interestingly, movements out of lower tiered employment and into formal wage employment is most pronounced for prime-aged adults. The youngest and the oldest see relatively less "positive" movements along the jobs ladder.

Figure 3: Changes in formal wage employment by region
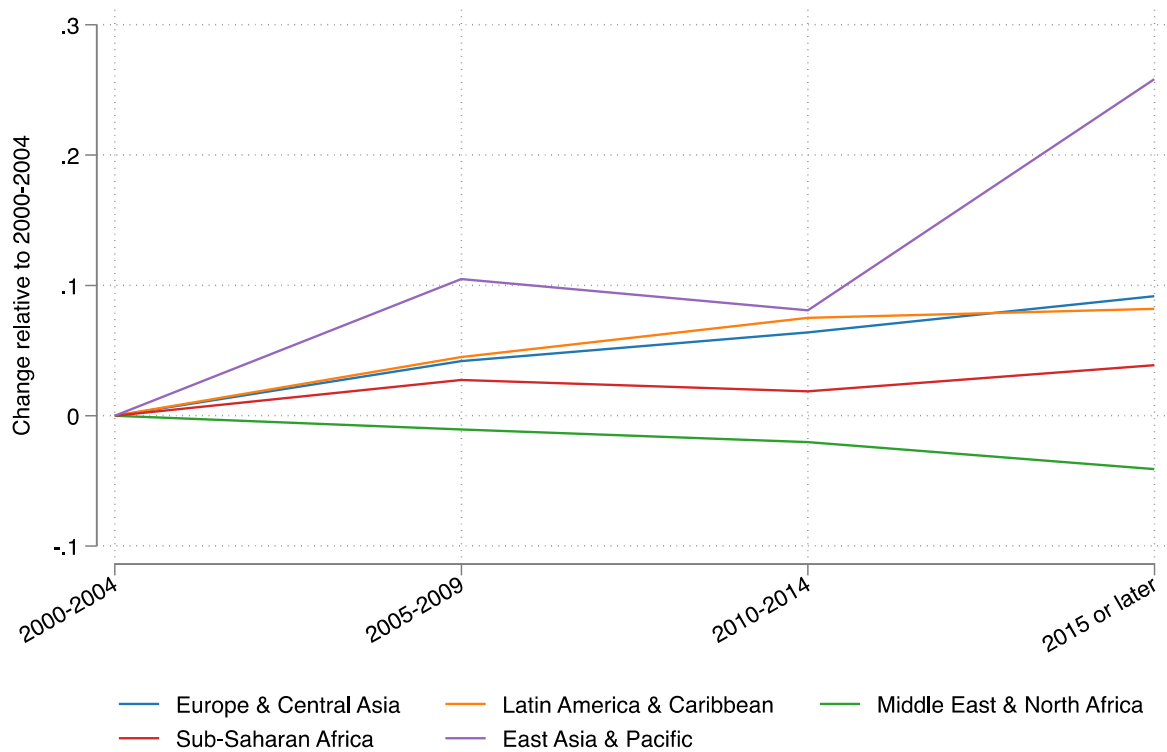


Notes. The figure shows coefficients from a regression with country fixed effects. 2000-2004 is the base time period, meaning changes are measured relative to 2000-2004. The figure includes only formal wage employment. Due to a lack of observations in earlier years, South Asia is omitted.

We also break out these changes over time across education categories in table 3. We create three separate education categories: "low" includes people with primary education completed as highest attainment, "medium" refers to having completed lower secondary education and having some upper secondary education, and "high" refers to upper secondary education completed and any post-secondary education attainment.

## Table 2: Changes across education categories

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Education: | Low | Medium | High | All |
| Upper tier self-employment | | | | |
| Year (10s) | -0.004 | -0.006 | 0.004 | -0.003 |
| | (0.003) | (0.005) | (0.007) | (0.003) |
| Formal wage employment | | | | |
| Year (10s) | 0.016 | 0.007 | -0.031 | 0.034** |
| | (0.019) | (0.015) | (0.032) | (0.014) |
| Upper tier informal wage | | | | |
| Year (10s) | -0.003 | 0.001 | -0.000 | -0.010 |
| | (0.010) | (0.007) | (0.003) | (0.007) |
| Lower tier informal wage | | | | |
| Year (10s) | -0.003 | 0.001 | -0.000 | -0.010 |
| | (0.010) | (0.007) | (0.003) | (0.007) |
| Lower tier self-employment | | | | |
| Year (10s) | -0.049** | -0.002 | 0.006* | -0.009 |
| | (0.020) | (0.009) | (0.004) | (0.009) |
| Unemployed | | | | |
| Year (10s) | -0.007 | -0.011 | 0.010** | -0.001 |
| | (0.005) | (0.012) | (0.004) | (0.003) |
| Inactive | | | | |
| Year (10s) | 0.056** | 0.016 | 0.004 | -0.011 |
| | (0.024) | (0.011) | (0.011) | (0.011) |
| Share in education category | | | | |
| Year (10s) | -0.086*** | 0.037*** | 0.049*** | N/A |
| | (0.010) | (0.009) | (0.005) | N/A |

Notes. Each cell reports results from separate regressions. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. "Low" education is defined as primary or below, "medium" is lower secondary completion and some upper secondary education, and "high" is upper secondary completed and above. * $p<0.10$ ** $p<0.05$ *** $p<0.01$.

Focusing first on formal wage employment, we do not see any changes within each education category, but we do see the overall increase in the sample as a whole. This means that for each particular education category there was no significant increase in formal jobs nor in upper tier informal jobs. This is likely explained by the regressions in the bottom row, which show that educational attainment among workers is increasing on average in the sample, pointing to a positive correlation between the increase in formal jobs and the improvement in the overall education levels. Overall formal wage employment can increase even if it does not increase within each education category, since higher levels of education are associated with being

situated higher on the jobs ladder.[6,7] Interestingly, for higher educated people there has been a significant - albeit small - increase in lower tier informal self-employment and inactivity over time pointing to human capital under-utilization due to labor market frictions (and other potential barrier as social norms) and/or over investment in education compared to labor demand.

To summarize the descriptive statistics, across all countries there is a clear upward trend in the share of people engaged in formal wage jobs second clear pattern and a decrease over time in both inactivity and unemployment. Categories of informal jobs show no clear pattern over time. The transitions to formal wage employment seem to be concentrated in wealthier countries. High-income countries, as a group, have seen rapid increases in formal wage employment, as have East Asia and the Pacific and Latin America and the Caribbean. Lower-income countries are being left behind, while the Middle East and North Africa seem to experience overall decreases in employment positions on the jobs ladder.

## 3.2 How are changes in the jobs ladder associated with growth and poverty reduction?

This subsection examines the correlations between movements on the jobs ladder and both economic growth and poverty reduction. While the GDP results from the previous regressions already hinted at some of these correlations, we begin with a simple scatter plot of the shares of the working-age population unemployed, inactive and in different rungs on the job ladder and GDP per capita.

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[6] If we simply regress the ladder shares on the proportion of the population that has more than secondary education, we see large, positive correlations with formal wage employment and large, negative correlations with informal upper and lower tier wage employment. We discuss education more in the next section.

[7] Figure A1 in the appendix shows trends in education across country income categories. The increase in secondary completion is most pronounced for low-income countries, while secondary education increases most in high-income countries.

## Figure 4: The jobs ladder and economic development
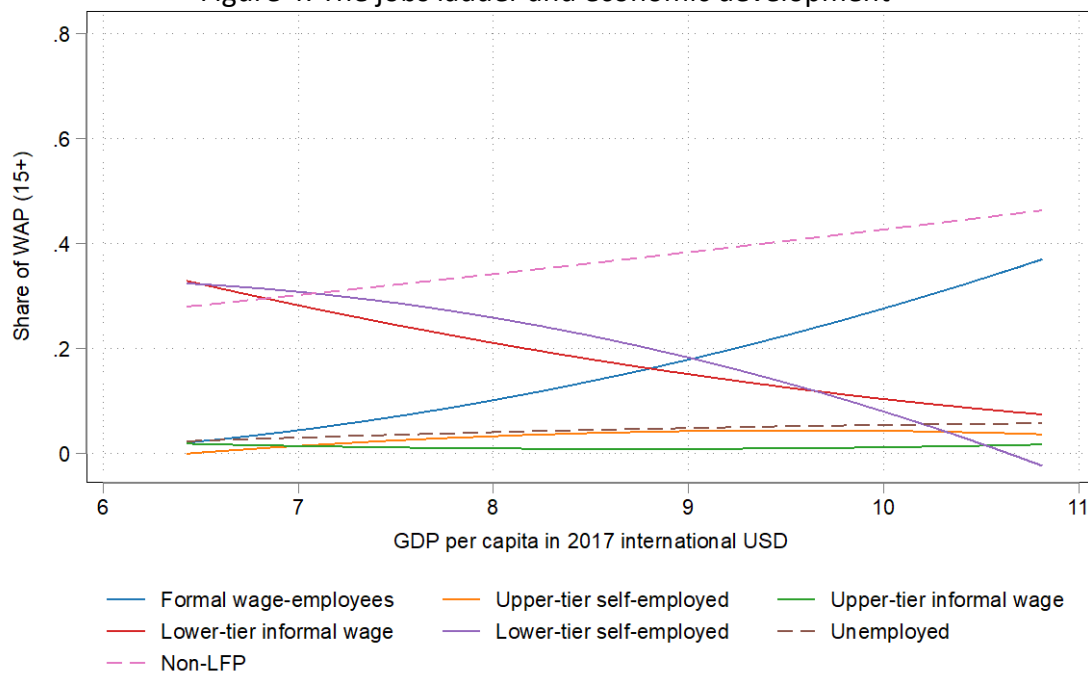


Notes. The figure excludes the top and bottom one percent of the x-axis. WAP stands for working-age population.

## Figure 5: The jobs ladder and economic development, by gender
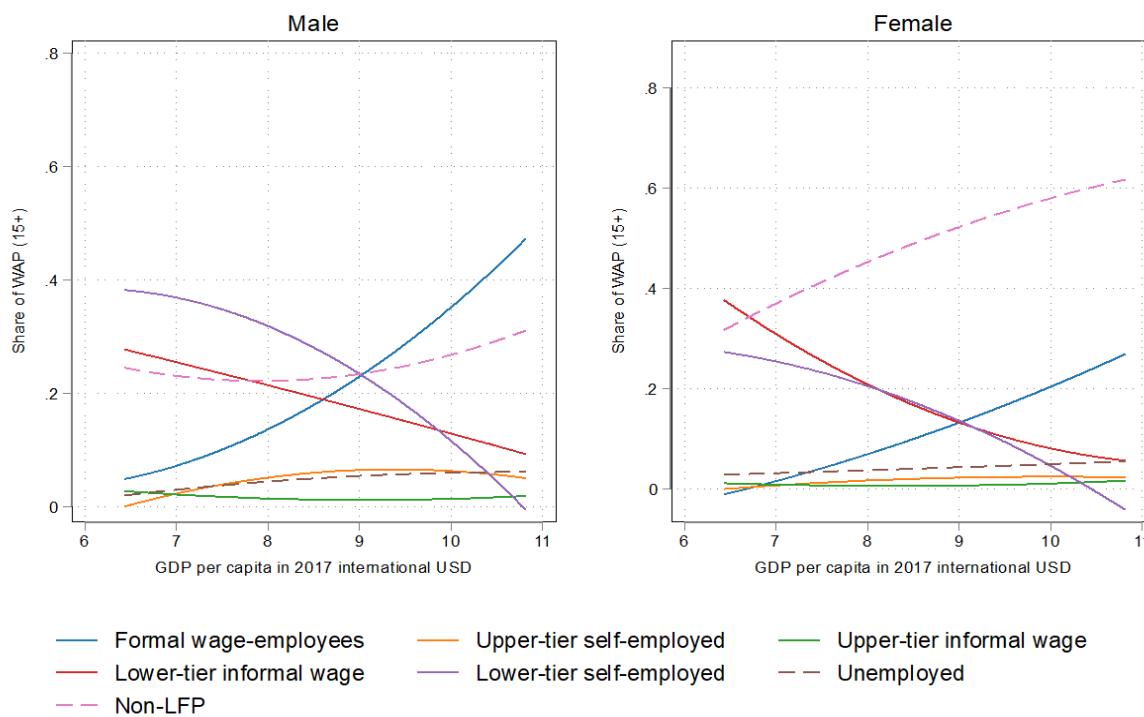


Notes. The figures exclude the top and bottom one percent of the x-axis. WAP stands for working-age population aged 15 and above.

Figure 5 presents the same graph separately for men (left graph) and women (right graph). The stock of men in formal wage employment and upper tier informal self-employment increases as countries develop more than women, while women have a more pronounced movement out of the labor force than men[8]. However, men also exhibit slower movement out of lower-tier wage employment than women do, though both groups see similar decreases in lower-tier self-employment – the category with the sharpest decreases across the GDP distribution[9].

Table 4: Jobs ladder and extreme poverty

| | (2) $1.90 Headcount | (4) $3.20 Headcount | (6) $5.50 Headcount |
|---|---|---|---|
| Upper-tier self-employed | 0.163 | 0.312 | -0.048 |
| | (0.188) | (0.206) | (0.166) |
| Formal wage | 0.053 | 0.023 | -0.405*** |
| | (0.092) | (0.098) | (0.107) |
| Upper-tier informal wage | -1.938** | -2.307** | -0.253 |
| | (0.825) | (0.943) | (0.618) |
| Lower-tier Informal wage | -0.008 | 0.131 | 0.160 |
| | (0.170) | (0.128) | (0.117) |
| Unemployed | 0.463* | 0.751** | -0.059 |
| | (0.276) | (0.343) | (0.315) |
| Inactive | 0.008 | -0.069 | -0.135 |
| | (0.189) | (0.200) | (0.119) |
| Total pop. (log) | -0.016 | 0.033 | 0.350** |
| | (0.169) | (0.179) | (0.146) |
| GDP p.c. (log) | -0.042 | -0.064 | -0.118 |
| | (0.052) | (0.064) | (0.079) |
| Observations | 338 | 338 | 338 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country-survey type and year fixed effects are included in all specifications. The country-survey type fixed effect takes into account significant changes in the survey used to measure poverty such that poverty rates are comparable across time. The omitted category is lower-tier self-employment.  * p<0.10 ** p<0.05 *** p<0.01.

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[8] High female inactivity rates in our sample are driven by Saudi Arabia and Türkiye.
[9] As we measure net changes, not gross, we cannot distinguish transition in and out. The correlation captures levels, not individual transitions.

How do changes in the jobs ladder translate into changes in poverty? Table 4 presents results from equation (2), which regresses headcount poverty rates at different poverty lines on the proportion of working age people on four ladder categories, the unemployment and the inactive, with informal lower-tier self-employment being the omitted category. We present results for three separate poverty lines: $1.90, $3.20, and $5.50. Our key result is that higher levels of informal upper-tier wage employment are negatively associated with extreme poverty measured at both the $1.90 and $3.20 poverty lines. However, this relationship becomes statistically insignificant – and the coefficient reduces by substantially – at the $5.50 poverty line in the table. The coefficient on formal wage employment, however, is negative and significant at the highest poverty line. This seems to suggest that informal upper-tier wage jobs are a useful "stepping-stone" for reducing extreme poverty in lower income countries but become less important at higher income thresholds, where formal wage employment has a more prominent role is reducing poverty.[10] This means that jobs that require higher skills matter more for poverty reduction than formal jobs (of any skill level) in developing countries. We check the robustness of this result by running the same regressions separately for each country income group and region. The positive impact of upper-tier informal wage work on poverty reduction at the $1.90 line is validated and stronger for LICs and LMICs (Table A20), with the caveat that the sample size for HICs is small to interpret meaningfully results. It is important to note that we control for GDP per capita in all regressions. This means that the results reflect changes in poverty conditional on GDP growth, rather than general development trends.

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[10] Table A22 presents results without the heteroskedasticity correction. The key findings remain.

The results show that changes in employment structure, conditional on changes in per capita GDP and population, can have discernible correlations with country poverty rates. What happens if we remove GDP from the regression? In general, the main results from above hold (Table A21). The only notable change is that informal upper wage employment is also correlated with lower levels of poverty at the highest poverty line. As such, these patterns are robust to the inclusion of GDP, which we interpret as meaning that the employment structure itself is a key determinant of poverty reduction, not just overall growth levels. Specifically informal upper-tier wage jobs are the types of jobs that matter to lift people out of extreme poverty - these are more probably the jobs poor people have access to - while formal wage jobs are key to reduce poverty measured at higher poverty lines.

## 3.3 What country characteristics are associated with progression up the ladder and poverty reducing jobs?

While we have seen that changes in education are likely correlated with movements up the jobs ladder, are there any other country-specific characteristics that predict changes in the job ladder rungs? We begin with a simple specification with educational attainment, based on equation (3), where we include the proportion of people with secondary education (meaning lower secondary education completed and having some upper secondary education) and with post-secondary (including upper secondary education completed and any post-secondary education attainment), treating the proportion of people with primary education completed or less as highest attainment as the omitted category. The interpretation of the coefficients is the conditional correlation of a shift from nobody in that education category to everyone in that category, relative to primary education completed and less.

25

These results are presented in Table 5. Equivalently, dividing the coefficient by 10 gives the conditional correlation of a ten-percentage-point (pp) net shift in the category. We find that improvements in education levels are not significantly correlated with increases in upper tier self-employment and formal wage employment. The most striking results are those for post-secondary education. A ten percentage points increase in post-secondary education is associated with a 3.7 pp increase in the share of workers in formal wage employment (although statistically significant at the 10-percent level.), a 3.8 pp decline in the share of workers in informal lower-tier wage employment, and a 0.6 pp decline in the share of workers in upper tier wage employment. In contrast, the results on lower secondary education are less conclusive. Increased lower secondary education is associated with a modest shift out of lower tier self-employment into formal wage work and upper tier informal jobs, but the correlations are not statistically significant. Importantly, the above-mentioned results are most pronounced for men, again pointing to the fact that for the same level of education, women's human capital is not utilized in the labor market as productively as men's (Table A11 and A12).

To try to unpack the strong correlation between improvements in education and shifts to formal jobs, we interact the education variables with dummies for country income groups. We find that the increase in postsecondary attainment translated into more formal wage jobs in high income countries (HICs) but not in other countries, and into more upper tier self-employment (though not in a statistically significant way). The coefficients of the interaction terms of lower secondary education with country income group dummies are all not statistically significant. Possible explanations of why the improvement in education is strongly associated with shifts to formal jobs in HICs include the higher quality of education in HICs and higher investments in

26

complementary factors of production that enhance the demand and productivity of higher educated workers.

Table 5: Educational attainment and jobs ladder (All countries)

| | (1) Upper tier self-emp. | (2) Formal wage | (3) Upper tier informal wage | (4) Lower tier informal wage | (5) Lower tier informal self-emp. | (6) Unemployed | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Lower secondary completed | 0.045 | 0.194 | 0.020 | -0.070 | -0.134 | 0.053 | -0.108 |
| | (0.047) | (0.131) | (0.024) | (0.106) | (0.117) | (0.044) | (0.141) |
| Upper secondary completed and above | -0.042 | 0.369* | -0.062** | -0.379*** | -0.059 | -0.010 | 0.184 |
| | (0.049) | (0.208) | (0.029) | (0.118) | (0.135) | (0.048) | (0.177) |
| Total pop. (log) | -0.145** | -0.198** | 0.030 | 0.159 | 0.123 | 0.053 | -0.022 |
| | (0.071) | (0.088) | (0.024) | (0.155) | (0.153) | (0.054) | (0.120) |
| GDP p.c. (log) | 0.017 | 0.175 | 0.023* | 0.012 | -0.122 | 0.000 | -0.105* |
| | (0.025) | (0.116) | (0.012) | (0.045) | (0.094) | (0.019) | (0.061) |
| Observations | 429 | 429 | 429 | 429 | 429 | 429 | 429 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education completed as highest attainment or less is the omitted category. Shares refer to all workers with non-missing firm size.
* p<0.10 ** p<0.05 *** p<0.01.

To put these coefficients in context, it is helpful to understand the within-country variation in the education variables. The within-country variation for lower secondary education completion is 0.035, while it is 0.03 for post-secondary education. Using the latter, a one-standard-deviation increase in post-secondary education leads to a decrease in informal upper-tier wage employment of around 0.2 percentage points. A similar increase in post-secondary education leads to a decrease in informal lower-tier wage employment of around 1.4 percentage points. While these changes seem small, we note that they are relatively large when compared to the means of the five job ladder shares. The mean for informal upper wage employment is 0.015, meaning the one-standard-deviation increase in above secondary employment leads to a

decrease of approximately 13.3 percent of the mean, while the value for lower wage employment is around 8.6 percent of the mean. Table A17 in the appendix presents the same regression results, but without the heteroskedasticity correction. The signs of the coefficients are generally similar, but some change in magnitude. The most obvious change is the coefficient on above upper secondary for formal wage employment; while still positive, it is much smaller in magnitude.

Table 6: Urbanization and jobs ladder (All countries)

|  | (1)<br>Upper tier Informal self-emp. | (2)<br>Formal wage | (3)<br>Upper tier informal wage | (4)<br>Lower tier informal wage | (5)<br>Lower tier informal self-emp | (6)<br>Unemployed | (7)<br>Inactive |
|---|---|---|---|---|---|---|---|
| Urban pop. (log) | -0.037 | 0.050 | 0.025 | 0.047 | -0.127 | 0.060** | -0.017 |
|  | (0.049) | (0.141) | (0.020) | (0.083) | (0.125) | (0.029) | (0.098) |
| Rural pop. (log) | -0.055** | -0.189** | 0.002 | 0.028 | 0.183* | -0.027 | 0.059 |
|  | (0.023) | (0.073) | (0.011) | (0.066) | (0.097) | (0.031) | (0.113) |
| GDP p.c. (log) | 0.023 | 0.187* | 0.010 | -0.025 | -0.108 | -0.010 | -0.077 |
|  | (0.027) | (0.096) | (0.010) | (0.037) | (0.077) | (0.020) | (0.047) |
| Observations | 466 | 466 | 466 | 466 | 466 | 466 | 466 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education or less is the omitted category. Shares refer to all workers with non-missing firm size.  * p<0.10 ** p<0.05 *** p<0.01.

We now turn to the relationship between changes in the job ladder and urbanization and population growth. Table 6 presents the results of the regressions based on equation (3) separating population into urban and rural population. There are three key coefficients worth noting. First, higher levels of urban population are modestly correlated with higher levels of unemployment. This is reminiscent of the recent work exploring the relationship between urban unemployment and the unskilled population (S. Feng et al., 2017), though we note that we do not find the same negative relationship between GDP and unemployment as others (Y. Feng et

28

al., 2024). Consistent with this story, urban employment increases unemployment for the youngest adults Table A13, with much smaller changes for older adults (Table A14 and A15).

Second, higher levels of population in rural areas appear to lead households to work in lower-tier informal jobs, possibly due to a lack of (high-paying) jobs in rural areas. Larger rural population, controlling for urban population, is associated with moderate shifts from formal wage work and upper tier self-employment to lower tier informal self-employment, indicating a concentration of employment in the lowest tier of the ladder. We also look at whether the relationship varies by country income groups: we find that urbanization is significantly associated with shifts from informal to formal wage jobs only in HICs and that the positive relationship with unemployment is driven by HICs. Interestingly, in UMICs larger rural populations are positively associated with shifts from lower-tier informal self-employment to upper tier self-employment and to movements up the job ladder in HICs. In the appendix we present results without heteroskedasticity weighting in Table A18. The main findings, especially around unemployment, remain.

Next, we investigate whether the share of the workforce working in larger firms impact the quality of jobs available. We turn to this question in Table 7 , which shows how the share of workers in each job ladder rung changes based on the proportion of the workers in firms of different sizes. The omitted category is the share of employment in firms with five or fewer employees, meaning that all coefficients can be interpreted relative to that group.

29

Table 7: Firm size and movements on the jobs ladder (ALL COUNTRIES)

| | (1) Upper tier self-emp. | (2) Formal wage | (3) Upper tier informal wage | (4) Lower tier Informal wage | (5) Lower tier self-emp | (6) Unemployed | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Share in firms 6-20 | 0.031 | 0.011 | 0.048** | 0.185* | -0.208** | 0.020 | -0.087 |
| | (0.021) | (0.159) | (0.024) | (0.106) | (0.092) | (0.018) | (0.080) |
| Share in firms 21-50 | 0.003 | 0.315 | 0.000 | 0.085 | -0.230*** | 0.026 | -0.199* |
| | (0.046) | (0.189) | (0.016) | (0.078) | (0.084) | (0.027) | (0.117) |
| Share in firms 51+ | 0.035 | 0.170 | 0.008 | 0.002 | -0.126* | 0.074 | -0.163 |
| | (0.063) | (0.120) | (0.017) | (0.079) | (0.072) | (0.044) | (0.170) |
| Total pop. (log) | -0.182 | -0.197 | 0.025 | 0.362 | -0.010 | 0.052 | -0.049 |
| | (0.147) | (0.132) | (0.043) | (0.231) | (0.271) | (0.080) | (0.222) |
| GDP p.c. (log) | 0.005 | 0.213*** | 0.009 | -0.017 | -0.168** | -0.016 | -0.024 |
| | (0.040) | (0.071) | (0.012) | (0.044) | (0.068) | (0.017) | (0.064) |
| Observations | 323 | 323 | 323 | 323 | 323 | 323 | 323 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. Firms size 1-5 is the omitted category. Shares refer to all workers (including wage workers, self-employed, employers and unpaid workers) with non-missing firm size. We assume that self-employed work in a 1-person business. * $p<0.10$ ** $p<0.05$ *** $p<0.01$.

Overall, the results indicate that higher shares of employment in firms with more than 5 employees compared to microenterprises are significantly associated with movements out of lower tier informal self-employment. In particular, the growth of small firms – with size between six and 20 employees –is positively correlated with shifts from informal lower tier self-employment to upper-tier- but also lower-tier informal wage employment. Unpacking the correlation by country income group we find that increasing shares of the workforce in small firms (with 6 to 20 employees) lead to shifts to formal wage employment in UMICs and HICs, though the coefficient - albeit positive - is not significant in LMICs and LICs. In LMICs and UMICs the increasing incidence of medium firms (with 21-50 employees) is positively associated with shifts from formal wage work to informal upper tier wage employment.

We also see marginally significant increases in unemployment as larger firms become more common (and significant increases without heteroskedasticity corrections (Table A19). The changing industrial sector thus seems to be correlated with increases in unemployment, which

may be related to some of the trends documented in Y. Feng et al. (2024). We also note the decreases in non-labor force participation, but the coefficients are too imprecise for firm conclusions.

Finally, we look at changes in the jobs ladder based on changes in sector of employment (agriculture, manufacturing and services). Table 8 shows that movements out of agricultural employment and into manufacturing employment are associated with increases in formal wage employment but that growth in services does not show the same relationship. We also explore the extent to which changes in trade orientation and capital deepening are correlated with better jobs outcomes. Table A16 looks at correlations between exports and capital stocks and movements on the jobs ladder. However, many of these variables are available for only a subset of country-year surveys and, as such, we do not see any significant within-country correlations.

Table 8: Sectors of employment and changes in the jobs ladder

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Emp. share in manufacturing | -0.337 (0.234) | 0.811 (0.531) | -0.077 (0.064) | -0.550** (0.225) | -0.281 (0.560) | 0.121 (0.126) | 0.313 (0.294) |
| Emp. share in services | -0.285 (0.195) | 0.546 (0.348) | -0.085 (0.052) | -0.380* (0.201) | 0.054 (0.324) | 0.041 (0.115) | 0.109 (0.281) |
| Total pop. (log) | -0.081** (0.040) | -0.340*** (0.105) | 0.061*** (0.022) | 0.227 (0.151) | 0.138 (0.142) | 0.033 (0.066) | -0.036 (0.151) |
| GDP p.c. (log) | 0.045 (0.040) | 0.094 (0.071) | 0.024* (0.014) | 0.044 (0.054) | -0.090 (0.101) | -0.013 (0.022) | -0.105* (0.056) |
| Observations | 466 | 466 | 466 | 466 | 466 | 466 | 466 |

Notes. All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Only older adults are included. * p<0.10 ** p<0.05 *** p<0.01.

# 4. Conclusion

In this paper, we document patterns of labor (re)allocation across about 90 countries over the last three decades. Overall, across the entire sample, formal wage employment has increased over time, inactivity and unemployment decreased, while the four types of informal jobs do not present a clear trend. Looking within country groups, however, formal wage employment growth is mostly driven by higher income countries. We similarly see large decreases in other forms of employment only in high-income countries. In our sample, these changes in high-income countries are driven by East Asia and the Pacific, specifically Korea and Australia. We also document large changes in education categories. In the entire sample, educational attainment increased markedly between 1990 and 2020. For each of the three educational attainment categories (low, medium and high) we do not see large changes in employment type, but we do see large increases in formal employment overall, indicating that changes in education patterns are correlated with changes in the employment structure; populations with increasing education also see increasing formal wage employment. We do see increases in unemployment for the lowest educated group, which could be related to migration patterns and urban populations; we find that larger urban population is associated with higher levels of unemployment, as expected.

The main result is that the structure of employment is correlated with poverty rates. We find that informal upper-tier wage employment is a strong and statistically significant predictor of lower levels of poverty at the $1.90 and $3.30 poverty lines, while formal wage employment (both skilled and unskilled) is the most important at the higher poverty line of $5.50. This means that jobs that require higher skills matter more for poverty reductions in lower income countries than the formality status. Importantly, these patterns hold even when we control for per capita

GDP in the regressions, indicating that employment structure on its own, separate from aggregate growth, is highly correlated with poverty rates.

What country characteristics are associated with shifts to formal jobs and upper tier informal jobs? To answer this question, we look at how changes in the stock of human capital (measured through education attainment) and physical capital affect the employment structure. We find that increasing shares of people with completed lower secondary education is associated with shifts from lower to upper-tier informal jobs, but the correlations are not statistically significant. On the contrary, countries with increasing shares of people with post-secondary education are significantly correlated with increases in formal wage jobs, but not in upper tier informal jobs.

We also explore the relationship between the movement up the job ladder (as a proxy for labor productivity) and job structural transformations along the sectoral dimension (measured by the share of workers in non- agriculture sectors), the spatial dimension (measured by urban and rural populations) and the organizational dimensions (measured by the share of workers in larger firms and by the level of exports). Private sector development (organizational transformation) and higher shares in manufacturing are associated with climbing the job ladder. Specifically, shifts in the workforce from microenterprises to small firms are strongly associated with increases in pro-poor upper-tier informal wage employment, but at the cost of increases in informal lower-tier jobs. Labor reallocation from agriculture to manufacturing is associated with increases in formal wage employment. The results do not show strong and significant correlations between urbanization and movement up the job ladder to formal and informal upper tier jobs, while estimates on the contribution of exports and the stock of capital suffer

from imprecision due to the fact that many of these variables are available for only a subset of country-year combination.

While we document interesting patterns in labor allocation over time and correlations with countries' endowments and structural transformation, future research could do similar analyses of government policies. For example, do government labor market, industrial, or trade policies or programs predict changes in the structure of employment? Answering these types of questions is important for better understanding how policies in developing countries can effectively change employment patterns to accelerate poverty reduction.

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# Appendix

Table A1: Variable sources

| Variable names | Source |
|---|---|
| GDP per capita | Penn World Table 10.0 |
| Country income status | World Bank |
| Capital stock | Penn World Table 10.0 |
| Employment shares | International Labor Organization |
| Population | World Development Indicators |
| Poverty | World Bank Poverty and Inequality Platform |
| Share of 15+ people in the five Jobs ladder rungs, unemployed and inactivity | GLD, GMD, I2D2 |
| 25+ people by education attainment | JOIN |
| Workers by firm size | GLD, GMD, I2D2 |
| PPP, CPI | IMF World Economic Outlook Database |

Table A2: Surveys by year, country income, and region

| | 1990-1999 | 2000-2004 | 2005-2009 | 2010-2014 | 2015 or later | Total |
|---|---|---|---|---|---|---|
| **Panel A: By income status** | | | | | | |
| LIC | 10 | 12 | 18 | 37 | 25 | 102 |
| LMIC | 19 | 40 | 57 | 55 | 53 | 224 |
| UMIC | 8 | 221 | 33 | 34 | 37 | 134 |
| HIC | 0 | 8 | 9 | 11 | 5 | 33 |
| **Panel B: By region** | | | | | | |
| EAP | 0 | 11 | 11 | 18 | 12 | 52 |
| ECA | 1 | 8 | 13 | 15 | 14 | 51 |
| LAC | 26 | 47 | 63 | 54 | 54 | 244 |
| MENA | 3 | 2 | 9 | 9 | 11 | 34 |
| SAR | 0 | 0 | 7 | 10 | 7 | 24 |
| SSA | 7 | 14 | 14 | 31 | 22 | 88 |
| Total | 37 | 82 | 117 | 137 | 120 | 493 |

Notes: The sample includes surveys between 1990 and 2020 for 89 countries with non-missing information on the share of the working age population (aged 15 and above) in unemployment, out of the labor force and engaged in work according to the five job ladder rungs. LIC: Lower income countries; LMIC: Lower-middle income countries; UMIC: Upper-middle income countries; HIC: High-income countries. The income classification if kept fixed at the year each country appears in the same for the first time. EAP: East Asia and the Pacific; ECA: Europe and Central Asia; L Latin America and the Caribbean; MENA: Middle East and North Africa; SAR: South Asia; SSA: Sub-Saharan Africa.

Table A3: Wage and earnings by job ladder rung

| | Upper-tier self-employed | Formal wage | Upper-tier informal wage | Lower-tier informal wage | Lower-tier informal self-employed |
|---|---|---|---|---|---|
| Median of median hourly wage (<u>wage workers</u>, 2017 PPP) | N/A | $3.07 | $2.36 | $1.74 | N/A |
| Number of countries | 0 | 76 | 76 | 76 | 0 |
| Median of median hourly earnings (<u>all workers</u>, 2017 PPP) | $4.10 | $3.15 | $2.55 | $1.92 | $1.91 |
| Number of countries | 59 | 59 | 59 | 59 | 59 |

Notes. The sample includes 309 harmonized surveys between 1990 and 2020 for 59 countries (19 LICs, 26 LMICs, 13 UMICs and 1 HIC based on the income classification of the country for the year the first survey is available) with available information on wages, earnings and the classification of workers across the 5 job ladder rungs. Median hourly earning are calculated by first converting local currencies to 2017 USD PPPP based on IMF data. Subsequently, the within country median is calculated, followed by the median across countries.

Table A4: Percentage of adults (15+) in each category

| | Upper tier self-employed | Formal wage employee | Upper tier wage employee | Lower tier wage employee | Lower tier self-employed | Unemployed | Inactive |
|---|---|---|---|---|---|---|---|
| **Panel A: By country income status** | | | | | | | |
| LIC | 3.0 | 10.2 | 1.1 | 21.7 | 26.5 | 4.3 | 33.1 |
| LMIC | 4.8 | 18.3 | 1.2 | 15.1 | 15.6 | 5.0 | 40.0 |
| UMIC | 4.0 | 26.9 | 1.9 | 11.3 | 10.1 | 6.6 | 39.3 |
| HIC | 6.1 | 37.3 | 3.2 | 7.7 | 5.5 | 2.8 | 37.5 |
| **Panel B: By region** | | | | | | | |
| EAP | 4.8 | 31.1 | 2.8 | 10.7 | 12.7 | 2.5 | 35.4 |
| ECA | 3.0 | 23.4 | 0.5 | 9.7 | 10.8 | 7.2 | 45.3 |
| LAC | 5.0 | 21.8 | 1.7 | 15.0 | 15.7 | 4.8 | 36.0 |
| MENA | 4.8 | 14.9 | 1.2 | 14.7 | 5.6 | 5.7 | 53.0 |
| SA | 3.1 | 10.7 | 1.3 | 19.9 | 16.8 | 2.3 | 45.9 |
| SSA | 2.8 | 12.3 | 0.9 | 19.0 | 23.8 | 7.1 | 34.0 |
| **Total** | **4.3** | **20.4** | **1.5** | **14.9** | **15.7** | **5.2** | **38.2** |

Notes: The underlying sample includes 493 surveys for 89 countries. The income classification is kept fixed as that of the year each country appears in the sample for the first time. EAP: East Asia and the Pacific; ECA: Europe and Central Asia; L Latin America and the Caribbean; MENA: Middle East and North Africa; SAR: South Asia; SSA: Sub-Saharan Africa.

Table A5: Average changes in categories by decade

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Upper-tier self emp. | Formal wage | Upper-tier informal wage | Lower-tier informal wage | Lower-tier self emp. | Unemployed. | Inactive |
| Year (10s) | -0.003 | 0.037*** | -0.001 | -0.015** | -0.008 | -0.002 | -0.008 |
| | (0.003) | (0.012) | (0.001) | (0.007) | (0.008) | (0.003) | (0.011) |
| Observations | 493 | 493 | 493 | 493 | 493 | 493 | 493 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample.

* p<0.10 ** p<0.05 *** p<0.01.

Table A6: Changes in job categories by country income, male

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Upper-tier self emp. | Formal wage | Upper-tier informal wage | Lower-tier informal wage | Lower-tier self emp. | Unemployed. | Inactive |
| Year 10s | -0.015*** | 0.138** | -0.023** | -0.076** | -0.022*** | -0.002*** | 0.001** |
| (in HIC) | (0.002) | (0.029) | (0.006) | (0.018) | (0.003) | (0.000) | (0.000) |
| Year 10s | 0.003 | 0.015*** | -0.001* | -0.031*** | -0.014** | 0.000 | 0.028*** |
| (in UMIC) | (0.003) | (0.005) | (0.001) | (0.007) | (0.005) | (0.006) | (0.008) |
| Year 10s | -0.007* | 0.033** | -0.002 | -0.011 | -0.012*** | -0.007** | 0.005 |
| (in LMIC) | (0.004) | (0.016) | (0.003) | (0.008) | (0.004) | (0.003) | (0.010) |
| Year 10s | -0.027* | 0.048 | 0.005 | 0.010 | -0.019 | -0.004 | -0.013 |
| (in LIC) | (0.016) | (0.069) | (0.005) | (0.019) | (0.044) | (0.007) | (0.024) |
| Observations | 492 | 492 | 492 | 492 | 492 | 492 | 492 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample. Only men are included.

* p<0.10 ** p<0.05 *** p<0.01.

Table A7: Changes in job categories by country income, female

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Year 10s | -0.000 | 0.168** | -0.053** | -0.075** | -0.012*** | 0.002*** | -0.028*** |
| (in HIC) | (0.001) | (0.029) | (0.012) | (0.016) | (0.002) | (0.000) | (0.000) |
| Year 10s | 0.006*** | 0.036*** | -0.000 | -0.022*** | -0.008 | -0.001 | -0.011** |
| (in UMIC) | (0.001) | (0.005) | (0.001) | (0.004) | (0.005) | (0.008) | (0.005) |
| Year 10s | 0.004* | 0.034*** | 0.000 | -0.009 | 0.002 | 0.003 | -0.035* |
| (in LMIC) | (0.002) | (0.007) | (0.001) | (0.012) | (0.004) | (0.003) | (0.020) |
| Year 10s | -0.015 | 0.052 | 0.000 | -0.025 | -0.007 | -0.004 | -0.002 |
| (in LIC) | (0.010) | (0.047) | (0.002) | (0.024) | (0.037) | (0.006) | (0.028) |
| Observations | 492 | 492 | 492 | 492 | 492 | 492 | 492 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample. Only women are included.
* p<0.10 ** p<0.05 *** p<0.01.


Table A8: Changes in job categories by country income, youth

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Year 10s | -0.001*** | 0.061** | -0.047*** | -0.039*** | -0.001*** | -0.002** | 0.029*** |
| (in HIC) | (0.000) | (0.026) | (0.015) | (0.010) | (0.000) | (0.001) | (0.002) |
| Year 10s | 0.000 | 0.007** | -0.000 | -0.044*** | -0.006*** | 0.005 | 0.038*** |
| (in UMIC) | (0.000) | (0.003) | (0.001) | (0.010) | (0.001) | (0.011) | (0.001) |
| Year 10s | 0.001 | 0.012 | 0.000 | -0.018* | 0.000 | -0.006 | 0.010 |
| (in LMIC) | (0.002) | (0.011) | (0.001) | (0.010) | (0.004) | (0.004) | (0.018) |
| Year 10s | -0.006 | 0.027 | 0.002 | 0.002 | 0.002 | 0.005 | -0.032 |
| (in LIC) | (0.004) | (0.036) | (0.003) | (0.035) | (0.036) | (0.006) | (0.032) |
| Observations | 484 | 484 | 484 | 484 | 484 | 484 | 484 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample. Youth are defined as people aged 15-24.
* p<0.10 ** p<0.05 *** p<0.01.

### Table A9: Changes in job categories by country income, prime-age adults

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Year 10s | -0.010*** | 0.195*** | -0.041*** | -0.091*** | -0.023*** | 0.001*** | -0.032*** |
| (in HIC) | (0.000) | (0.026) | (0.007) | (0.017) | (0.002) | (0.000) | (0.001) |
| Year 10s | 0.004** | 0.035*** | -0.000 | -0.018*** | -0.015*** | 0.002 | -0.007* |
| (in UMIC) | (0.002) | (0.005) | (0.001) | (0.005) | (0.006) | (0.006) | (0.004) |
| Year 10s | -0.003 | 0.048*** | -0.001 | -0.004 | -0.010** | 0.003 | -0.032** |
| (in LMIC) | (0.003) | (0.013) | (0.003) | (0.008) | (0.004) | (0.003) | (0.014) |
| Year 10s | -0.028** | 0.071 | 0.003 | -0.006 | -0.038 | -0.004 | 0.003 |
| (in LIC) | (0.014) | (0.074) | (0.004) | (0.017) | (0.055) | (0.006) | (0.020) |
| Observations | 492 | 492 | 492 | 492 | 492 | 492 | 492 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample. Prime age adults are people aged 25-64.
* p<0.10 ** p<0.05 *** p<0.01.

### Table A60: Changes in job categories by country income, older adults

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Year 10s | 0.001 | 0.092*** | -0.004** | -0.040*** | -0.030*** | 0.002*** | -0.020*** |
| (in HIC) | (0.002) | (0.015) | (0.002) | (0.010) | (0.007) | (0.000) | (0.005) |
| Year 10s | 0.003* | 0.005*** | 0.000 | -0.007*** | -0.025** | -0.001 | 0.025* |
| (in UMIC) | (0.001) | (0.002) | (0.000) | (0.002) | (0.010) | (0.001) | (0.014) |
| Year 10s | -0.003** | 0.004* | 0.000 | 0.000 | -0.006 | 0.001 | 0.004 |
| (in LMIC) | (0.001) | (0.002) | (0.000) | (0.002) | (0.005) | (0.001) | (0.008) |
| Year 10s | -0.015 | 0.011 | 0.000 | 0.010 | -0.010 | -0.004 | 0.008 |
| (in LIC) | (0.011) | (0.007) | (0.001) | (0.011) | (0.027) | (0.003) | (0.024) |
| Observations | 423 | 423 | 423 | 423 | 423 | 423 | 423 |

All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Year (10s) is the average change in each category by *decade* in our sample. Older adults are defined as people aged 65 and above. * p<0.10 ** p<0.05 *** p<0.01.
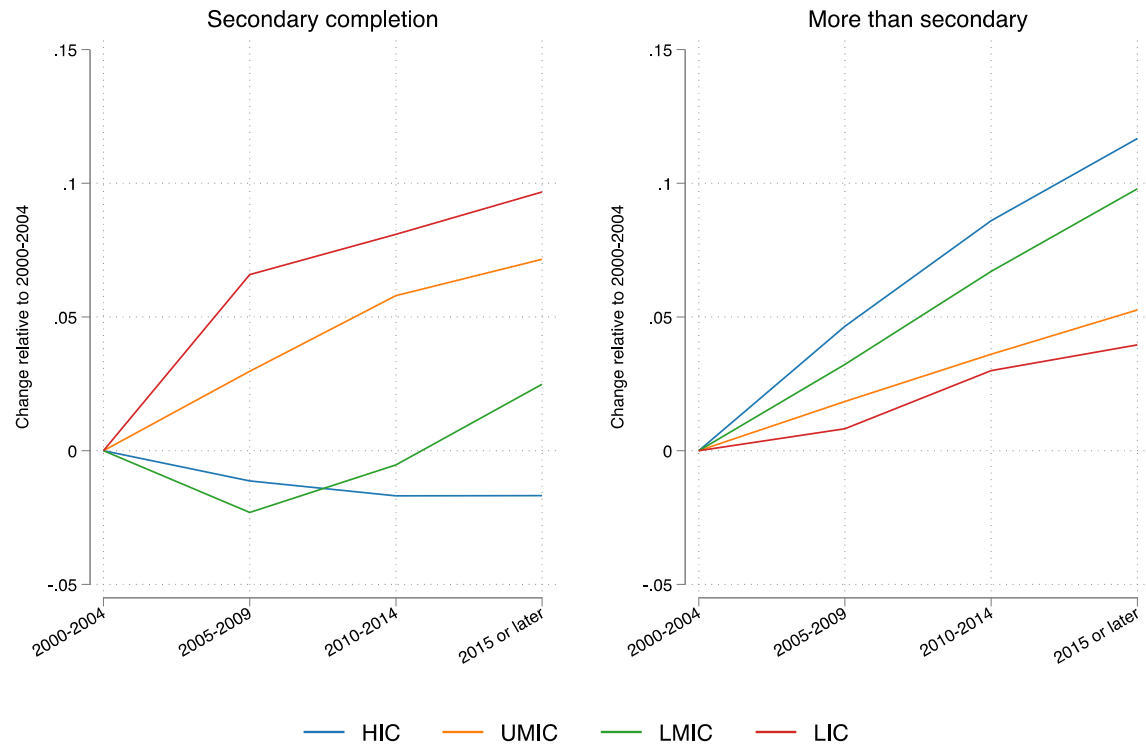
## Figure A1: Changes in education by country income



Secondary completion — More than secondary

HIC    UMIC    LMIC    LIC

Notes:   Calculations based on a sample of 401 surveys from 57 countries (30 surveys, 2 countries for HIC; 120 surveys, 10 countries for UMIC; 168 surveys, 23 countries for LMIC; and 83 surveys, 22 countries for LIC).

Table A11: Educational attainment and jobs ladder, men

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Secondary educ. | 0.047 | 0.232 | 0.014 | -0.129 | -0.102 | 0.071* | -0.133 |
| (proportion) | (0.070) | (0.142) | (0.025) | (0.131) | (0.136) | (0.042) | (0.115) |
| Above upper sec. | -0.071 | 0.540* | -0.090** | -0.607*** | 0.011 | -0.010 | 0.226 |
| (proportion) | (0.075) | (0.285) | (0.039) | (0.223) | (0.149) | (0.043) | (0.141) |
| Total pop. (log) | -0.200* | -0.172 | 0.023 | 0.198 | 0.183 | 0.079 | -0.111 |
| | (0.111) | (0.105) | (0.026) | (0.134) | (0.153) | (0.049) | (0.114) |
| GDP p.c. (log) | 0.041 | 0.200 | 0.032** | 0.038 | -0.173* | -0.010 | -0.128** |
| | (0.040) | (0.145) | (0.016) | (0.056) | (0.093) | (0.017) | (0.050) |
| Observations | 429 | 429 | 429 | 429 | 429 | 429 | 429 |

Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education or less is the omitted category. Shares refer to all workers with non-missing firm size.
* p<0.10 ** p<0.05 *** p<0.01.


Table A12: Educational attainment and jobs ladder, women

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Secondary educ. | 0.034 | 0.139 | 0.027 | -0.007 | -0.162 | 0.035 | -0.065 |
| (proportion) | (0.033) | (0.126) | (0.025) | (0.103) | (0.116) | (0.050) | (0.177) |
| Above upper sec. | -0.008 | 0.223 | -0.037 | -0.174 | -0.129 | -0.010 | 0.134 |
| (proportion) | (0.025) | (0.149) | (0.024) | (0.135) | (0.160) | (0.056) | (0.217) |
| Total pop. (log) | -0.092* | -0.222*** | 0.037 | 0.123 | 0.079 | 0.027 | 0.048 |
| | (0.049) | (0.081) | (0.026) | (0.194) | (0.174) | (0.064) | (0.142) |
| GDP p.c. (log) | -0.007 | 0.150* | 0.015* | -0.009 | -0.073 | 0.011 | -0.087 |
| | (0.014) | (0.090) | (0.009) | (0.053) | (0.101) | (0.022) | (0.076) |
| Observations | 428 | 428 | 428 | 428 | 428 | 428 | 428 |

Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education or less is the omitted category. Shares refer to all workers with non-missing firm size. The South African 2001 LFS has only data for men.
* p<0.10 ** p<0.05 *** p<0.01.

## Table A13: Changes in job categories by population, youth

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Urban pop. (log) | -0.014 | 0.088 | 0.013 | 0.103 | -0.218 | 0.080** | -0.053 |
| | (0.014) | (0.110) | (0.015) | (0.117) | (0.170) | (0.031) | (0.144) |
| Rural pop. (log) | -0.016* | -0.147** | -0.006 | 0.090 | 0.168 | -0.011 | -0.077 |
| | (0.008) | (0.057) | (0.010) | (0.119) | (0.151) | (0.039) | (0.155) |
| GDP p.c. (log) | 0.010 | 0.174** | 0.012 | -0.043 | 0.022 | -0.012 | -0.164** |
| | (0.008) | (0.086) | (0.009) | (0.066) | (0.103) | (0.030) | (0.064) |
| Observations | 459 | 459 | 459 | 459 | 459 | 459 | 459 |

Notes. All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Only youth aged 15-24 are included. * p<0.10 ** p<0.05 *** p<0.01.


## Table A14: Changes in job categories by population, prime-aged adults

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Urban pop. (log) | -0.056 | 0.035 | 0.034 | 0.025 | -0.094 | 0.045 | 0.010 |
| | (0.068) | (0.174) | (0.024) | (0.084) | (0.133) | (0.032) | (0.082) |
| Rural pop. (log) | -0.067** | -0.226** | 0.004 | 0.035 | 0.189** | -0.021 | 0.086 |
| | (0.030) | (0.096) | (0.014) | (0.054) | (0.088) | (0.035) | (0.100) |
| GDP p.c. (log) | 0.032 | 0.226* | 0.009 | -0.023 | -0.194** | -0.015 | -0.035 |
| | (0.037) | (0.116) | (0.012) | (0.032) | (0.085) | (0.020) | (0.045) |
| Observations | 465 | 465 | 465 | 465 | 465 | 465 | 465 |

Notes. All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Only prime-aged adults aged 25-64 are included. * p<0.10 ** p<0.05 *** p<0.01.

Table A15: Changes in job categories by population, older adults

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Urban pop. (log) | -0.080 | -0.101* | 0.006 | 0.097 | -0.086 | 0.027 | 0.137 |
| | (0.061) | (0.054) | (0.006) | (0.064) | (0.123) | (0.019) | (0.088) |
| Rural pop. (log) | -0.036 | 0.031 | 0.001 | 0.015 | 0.124 | -0.026 | -0.109 |
| | (0.032) | (0.034) | (0.004) | (0.024) | (0.112) | (0.019) | (0.086) |
| GDP p.c. (log) | 0.016 | 0.021** | 0.003 | 0.012 | 0.002 | 0.012 | -0.065* |
| | (0.025) | (0.009) | (0.002) | (0.015) | (0.050) | (0.010) | (0.038) |
| Observations | 404 | 404 | 404 | 404 | 404 | 404 | 404 |

Notes. All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Only older adults aged 65 and above are included.
* p<0.10 ** p<0.05 *** p<0.01

Table A16: Capital stock, exports, and movements on the jobs ladder

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Capital stock (log) | -0.033 | 0.024 | -0.009 | -0.120 | -0.080 | 0.033 | 0.185** |
| | (0.030) | (0.053) | (0.011) | (0.072) | (0.102) | (0.022) | (0.054) |
| Exports (log) | 0.012 | 0.052 | 0.008 | 0.015 | -0.063** | -0.025 | 0.001 |
| | (0.008) | (0.040) | (0.006) | (0.019) | (0.031) | (0.019) | (0.019) |
| Ore exports (log) | -0.006 | 0.018 | -0.002 | 0.001 | -0.005 | 0.007** | -0.012 |
| | (0.005) | (0.012) | (0.002) | (0.010) | (0.009) | (0.003) | (0.009) |
| Total pop. (log) | -0.109** | -0.434*** | 0.050* | 0.244 | 0.316* | 0.019 | -0.085 |
| | (0.052) | (0.138) | (0.026) | (0.150) | (0.175) | (0.073) | (0.130) |
| GDP p.c. (log) | 0.031 | 0.094* | 0.014 | 0.064 | 0.048 | -0.011 | -0.240*** |
| | (0.044) | (0.050) | (0.015) | (0.099) | (0.146) | (0.036) | (0.054) |
| Observations | 446 | 446 | 446 | 446 | 446 | 446 | 446 |

Notes. All regressions include country fixed effects. Standard errors are clustered at the country level and are in parentheses. Only older adults are included. * p<0.10 ** p<0.05 *** p<0.01.

Figure A2: Changes by decade and gender

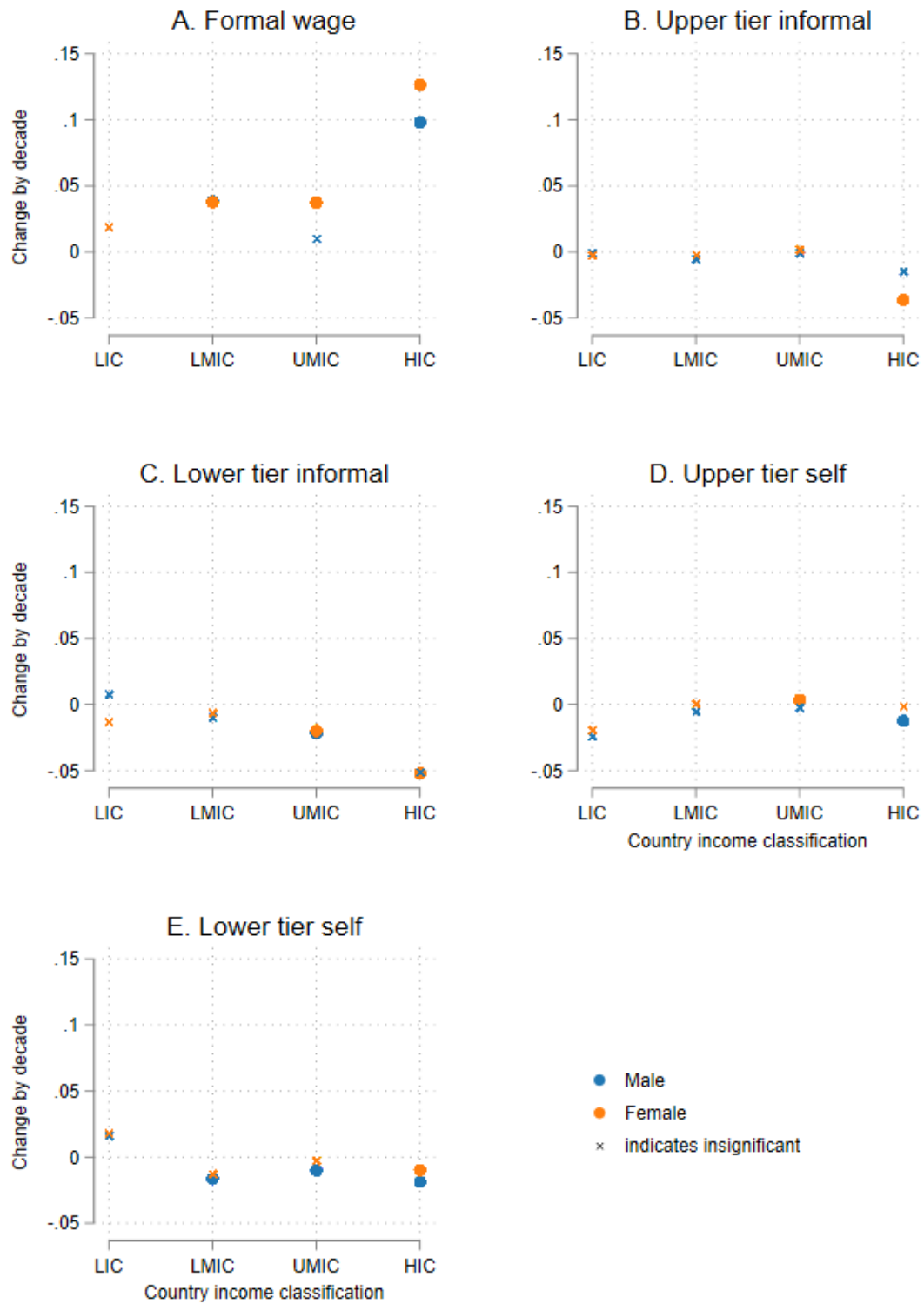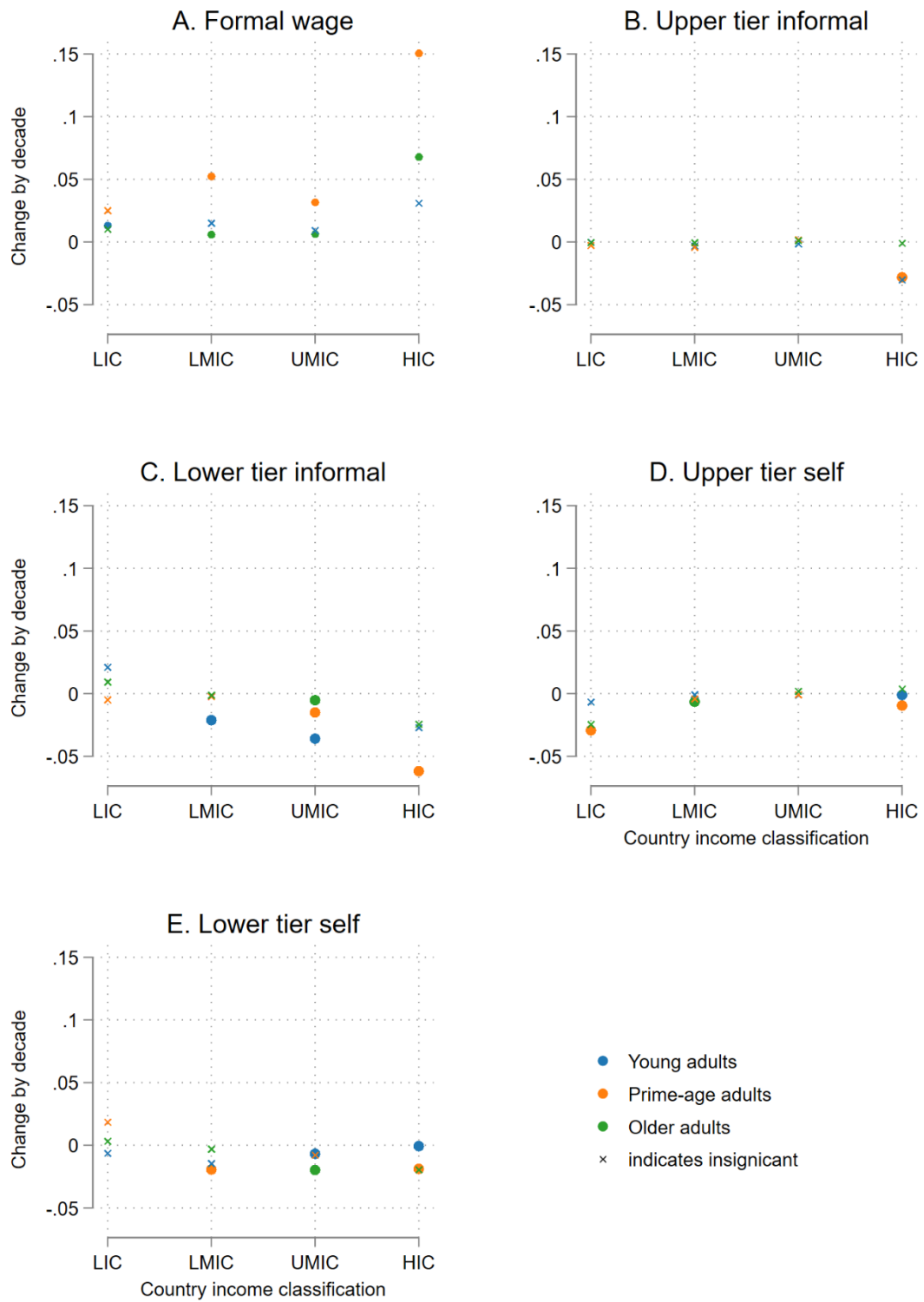## Figure A3: Changes by decade and age group

## Table A17: Educational attainment and jobs ladder, no heteroskedasticity weighting

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Secondary educ. | 0.017 | 0.108 | 0.034 | 0.046 | -0.092 | 0.074 | -0.186 |
| (proportion) | (0.069) | (0.115) | (0.029) | (0.145) | (0.159) | (0.045) | (0.123) |
| Above upper sec. | -0.044 | 0.143 | -0.065* | -0.547*** | 0.075 | -0.022 | 0.459** |
| (proportion) | (0.065) | (0.171) | (0.034) | (0.187) | (0.230) | (0.058) | (0.189) |
| Total pop. (log) | -0.103** | -0.201*** | 0.032 | 0.008 | 0.122 | 0.116** | 0.027 |
| | (0.049) | (0.070) | (0.020) | (0.167) | (0.143) | (0.045) | (0.127) |
| GDP p.c. (log) | 0.042 | 0.067 | 0.027** | 0.016 | -0.102 | 0.030 | -0.080 |
| | (0.036) | (0.041) | (0.013) | (0.058) | (0.110) | (0.028) | (0.066) |
| Observations | 429 | 429 | 429 | 429 | 429 | 429 | 429 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education or less is the omitted category. Shares refer to all workers with non-missing firm size.  * p<0.10 ** p<0.05 *** p<0.01.

## Table A18: Urbanization and jobs ladder, no heteroskedasticity weighting

| | (1) Upper-tier self emp. | (2) Formal wage | (3) Upper-tier informal wage | (4) Lower-tier informal wage | (5) Lower-tier self emp. | (6) Unemployed. | (7) Inactive |
|---|---|---|---|---|---|---|---|
| Urban pop. (log) | -0.038 | -0.063 | 0.025* | -0.019 | -0.048 | 0.125*** | 0.018 |
| | (0.035) | (0.057) | (0.014) | (0.095) | (0.088) | (0.034) | (0.079) |
| Rural pop. (log) | -0.048 | -0.072 | -0.001 | 0.030 | 0.190** | -0.113* | 0.014 |
| | (0.029) | (0.050) | (0.009) | (0.079) | (0.094) | (0.061) | (0.084) |
| GDP p.c. (log) | 0.044 | 0.088** | 0.020* | -0.003 | -0.111 | 0.028 | -0.066 |
| | (0.034) | (0.038) | (0.012) | (0.047) | (0.084) | (0.030) | (0.055) |
| Observations | 466 | 466 | 466 | 466 | 466 | 466 | 466 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. The proportion of people with primary education or less is the omitted category. Shares refer to all workers with non-missing firm size.  * p<0.10 ** p<0.05 *** p<0.01.

## Table A19: Firm size and movements on the jobs ladder, no heteroskedasticity weighting

| | Upper-tier self emp. | Formal wage | Upper-tier informal wage | Lower-tier informal wage | Lower-tier self emp. | Unemployed. | Inactive |
|---|---|---|---|---|---|---|---|
| Share in firms 6-20 | 0.026 | 0.042 | 0.026 | 0.217 | -0.207* | 0.042 | -0.147 |
| | (0.031) | (0.107) | (0.026) | (0.130) | (0.122) | (0.028) | (0.093) |
| Share in firms 21-50 | 0.016 | 0.002 | 0.024 | 0.231* | -0.217* | 0.101* | -0.158 |
| | (0.047) | (0.140) | (0.017) | (0.130) | (0.124) | (0.060) | (0.152) |
| Share in firms 51+ | 0.026 | 0.172 | -0.004 | 0.067 | -0.114 | 0.064 | -0.211 |
| | (0.054) | (0.129) | (0.022) | (0.100) | (0.087) | (0.049) | (0.170) |
| Total pop. (log) | -0.176 | -0.195* | 0.019 | 0.359 | -0.000 | -0.084 | 0.078 |
| | (0.133) | (0.114) | (0.038) | (0.241) | (0.264) | (0.125) | (0.238) |
| GDP p.c. (log) | 0.060 | 0.120*** | 0.026 | 0.031 | -0.227** | -0.013 | 0.002 |
| | (0.059) | (0.041) | (0.017) | (0.054) | (0.095) | (0.019) | (0.071) |
| Observations | 323 | 323 | 323 | 323 | 323 | 323 | 323 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country and year fixed effects are included in all specifications. Firms size 1-5 is the omitted category. Shares refer to all workers with non-missing firm size. * p<0.10 ** p<0.05 *** p<0.01

## Table A20: Jobs ladder and extreme poverty, by country income group

| | UMICs | LMICs | LICs | UMICs | LMICs | LICs |
|---|---|---|---|---|---|---|
| | $1.90 Headcount | $1.90 Headcount | $1.90 Headcount | $3.20 Headcount | $3.20 Headcount | $3.20 Headcount |
| Upper-tier self | -0.098 | -0.757** | 1.815*** | 0.561 | -1.452*** | 1.910*** |
| | (0.555) | (0.344) | (0.442) | (0.572) | (0.502) | (0.582) |
| Formal wage | 0.666 | 0.035 | -0.305** | 0.939* | -0.204 | -0.151 |
| | (0.462) | (0.231) | (0.114) | (0.509) | (0.295) | (0.169) |
| Upper-tier informal wage | 0.553 | -1.800* | -13.526*** | 1.079 | -2.735** | -14.220*** |
| | (0.471) | (0.914) | (2.196) | (0.747) | (1.321) | (3.144) |
| Lower-tier informal wage | 0.695* | 0.081 | 0.248 | 1.805*** | 0.420** | 0.201 |
| | (0.335) | (0.144) | (0.239) | (0.392) | (0.191) | (0.319) |
| Unemployed | 0.899* | 0.908*** | 2.188*** | 1.878*** | 0.636* | 3.614*** |
| | (0.485) | (0.232) | (0.195) | (0.462) | (0.375) | (0.338) |
| Inactive | 0.225 | -0.110 | 0.397** | 0.778* | -0.227 | 0.458* |
| | (0.275) | (0.116) | (0.168) | (0.367) | (0.169) | (0.230) |
| Total pop. (log) | 0.013 | 0.422*** | -0.872** | -0.238 | 0.644*** | -0.727 |
| | (0.265) | (0.148) | (0.392) | (0.309) | (0.177) | (0.506) |
| GDP p.c. (log) | -0.023 | -0.065 | 0.359** | 0.039 | -0.077 | 0.589*** |
| | (0.039) | (0.076) | (0.139) | (0.047) | (0.109) | (0.200) |
| Observations | 83 | 181 | 63 | 83 | 181 | 63 |

### Table A21: Jobs ladder and extreme poverty, no GDP controls

|  | $1.90 Headcount | $3.20 Headcount | $5.50 Headcount |
|---|---|---|---|
| Upper-tier self-employed | 0.184 | 0.344* | 0.012 |
|  | (0.187) | (0.200) | (0.167) |
| Formal wage | 0.027 | -0.017 | -0.478*** |
|  | (0.090) | (0.091) | (0.084) |
| Upper-tier informal wage | -2.214*** | -2.731*** | -1.037* |
|  | (0.761) | (0.824) | (0.618) |
| Lower-tier informal wage | -0.009 | 0.129 | 0.156 |
|  | (0.171) | (0.135) | (0.127) |
| Unemployed | 0.513* | 0.829** | 0.085 |
|  | (0.264) | (0.343) | (0.348) |
| Inactive | 0.008 | -0.069 | -0.135 |
|  | (0.190) | (0.203) | (0.126) |
| Total pop. (log) | -0.013 | 0.038 | 0.359** |
|  | (0.166) | (0.175) | (0.145) |
| Observations | 338 | 338 | 338 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country-survey type and year fixed effects are included in all specifications. The country-survey type fixed effect takes into account any possible changes in the survey used to measure poverty such that comparisons are reasonable across time. The omitted category is lower-tier self-employment.  * p<0.10 ** p<0.05 *** p<0.01.

### Table A22: Jobs ladder and extreme poverty, no heteroskedasticity weighting

|  | $1.90 Headcount | $3.20 Headcount | $5.50 Headcount |
|---|---|---|---|
| Upper-tier self-employed | 0.062 | 0.111 | -0.071 |
|  | (0.157) | (0.167) | (0.135) |
| Formal wage | 0.139 | 0.136 | -0.460*** |
|  | (0.170) | (0.176) | (0.135) |
| Upper-tier informal wage | -1.375** | -1.433** | -0.535 |
|  | (0.603) | (0.661) | (0.588) |
| Lower-tier informal wage | 0.029 | 0.061 | 0.036 |
|  | (0.158) | (0.105) | (0.081) |
| Unemployed | 0.456* | 0.664** | -0.128 |
|  | (0.269) | (0.256) | (0.242) |

| | | | |
|---|---|---|---|
| Inactive | 0.066 | -0.085 | -0.179** |
| | (0.170) | (0.168) | (0.090) |
| Total pop. (log) | -0.087 | -0.088 | 0.158** |
| | (0.178) | (0.151) | (0.077) |
| GDP p.c. (log) | -0.157** | -0.174** | -0.154** |
| | (0.067) | (0.069) | (0.066) |
| Observations | 338 | 338 | 338 |

Notes. Standard errors are in parentheses and are clustered at the country level. Country-survey type and year fixed effects are included in all specifications. The country-survey type fixed effect takes into account any possible changes in the survey used to measure poverty such that comparisons are reasonable across time. The omitted category is lower-tier self-employment.  * p<0.10 ** p<0.05 *** p<0.01.