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ABSTRACT

Economic Development and the Organisation of Labour: Evidence from the Jobs of the World Project*

The Jobs of the World Project is a public resource designed to enable research on jobs and poverty across and within countries over the entire development spectrum. At its core is a new data set assembled by harmonising Demographic and Health Surveys (DHS) and National Censuses (IPUMS) for all countries and all years after 1990 where data is available. The current version covers 115 countries, observed 4 times on average. We use the data to show how the nature of jobs and their allocation vary within countries by wealth and gender and across countries by stages of development. We discuss evidence that shows how disparities at the micro level lead to a misuse of human potential that links individual poverty to national income.

JEL Classification: O11, O12, J01, J20

Keywords: economic development, jobs, poverty, jobs of the world project

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1 Introduction

Labour is the sole endowment of the poor and the main factor of production in all economies. Understanding whether labour is employed efficiently is key to understanding poverty at the micro level and differences in national income at the macro level. In this paper we document how the organisation of labour - that is the nature of jobs and their allocation - varies within and across countries at different stages of development. We then discuss how disparities in the allocation of jobs along the lines of wealth and gender create a link between individual poverty and national income.

We make two contributions, one methodological and one substantive. The methodological contribution is to illustrate how individual level labour data, comparable across a large number of countries, can yield meaningful insights into macroeconomic phenomena and, symmetrically, how macroeconomic data can be useful to contextualise the findings of applied microeconomic studies. To this purpose, we assembled a new, publicly available data set, the Jobs of the World Data.[1] The data set is built from individual-level observations harmonising two sources: National Censuses (IPUMS) and Demographic and Health Surveys (DHS). Both are representative at the subnational level and their coverage is highly complementary as illustrated in Figure 1. The current version of the data covers 115 countries, observed on average 4 times between 1990 and 2019. We describe this in detail in section 2.

The substantive contribution of the paper consists in documenting broad transformations in the organisation of labour- that is the nature of jobs and their allocation - over the arc of economic development. As we outline these patterns in the first part of the paper (section 3), our aim is exploratory and descriptive so to provide a springboard for future research on these topics. We find three broad transformations. First, the marketisation of work; second, the emergence of firms as the main organising unit of work pulling workers out of self-employed work; and third, increasing specialisation and creation of 'new' jobs within firms. The marketisation of work occurs as labour moves from unpaid work -in the household, the family farm or a family business- to paid work. As countries get richer, a larger share of output is sold in the market and new jobs -such as, carpenters, tailors, weavers- become increasingly more common, providing services that were integrated in home production at the earlier stage (Boserup, 1970). The marketisation of work overlaps partly, but not fully with our ability to measure work, since paid work is typically recorded while only some forms of unpaid work are. We argue that due

[1] The Jobs of the World Database (JWD) is the core component of the Jobs of the World Project (JWP) which also contains a set of modular codes that enable researchers to customise the data, and a web platform http://jwp.iza.org that provides downloadable maps and charts based on the harmonised data. The project is part of the data building activities of the $G^2LM|LIC$ program, a joint initiative between the United Kingdom's Foreign, Commonwealth, and Development Office and the IZA - Institute of Labour Economics aiming at studying gender, growth, and labour markets in low-income countries.

to the elusive definition of work, it is hardly possible to say anything about the overall labour supply in the absence of standardised time use surveys.

The shift from home to markets coincides with the rise of wealth and gender as a determinant of the allocation of labour. At low levels of development, the share of people engaged in paid and unpaid work is higher in the bottom quintile of the within-country wealth distribution, but as unpaid work disappears the ordering by wealth switches and the share of people at work is highest in the top quintile.[2] As both men and women move out of unpaid work, men specialise in paid market work while women "disappear" from the measured labour force, presumably continuing to produce goods and services for the household. While both gender and wealth shape the allocation of paid work, differences by gender are much larger than differences by wealth.

The second transformation occurs as self-employed work is replaced by wage work. At low levels of development, even when output is increasingly traded in the market, most people are self-employed, while in the richest economies most paid work is in the form of wage work. The transformation is due to the emergence of firms that employ wage workers and direct their activities. The allocation of wage jobs also follows wealth and gender lines. As firms and wage jobs appear, it is men from wealthy households that get them first, followed by men of poorer households and finally women.

The third transformation occurs within firms, where we observe that the variety of occupations expands. In richer places where most people work in a firm, the number of different occupations available is much larger. A speculative explanation for this is that firms use technologies and management practices that allow for a more granular division of labour and a higher degree of specialisation than what is possible among a dissociated group of self-employed workers. While both men and women take up these 'new' jobs, the specific occupations in which they enter are different. Conditional on being in wage work, women are increasingly found in occupations classified as professionals, technicians, and clerks, while men enter work in crafts and as machine operators. As a consequence, the expansion of occupational variety coincides with an increase in occupational segregation by gender.

In summary, we see that the nature of jobs changes over the course of development from subsistence work to self-employed work to increasingly specialised wage work but wealth and gender shape the allocation of these changing jobs in the same way throughout. The "new" jobs are disproportionately assigned to men in wealthy households, and differences between genders are generally larger than differences between wealth classes. To the extent that men and women are equally able to perform the same task, this disparity will create a link between individual level outcomes and national income via misallocation. The rest of the paper discusses potential

[2] Our data supports many of the patterns uncovered by Boserup, 1970.

causes and consequences of the gendered division of labour.[3]

We provide three new pieces of evidence from our own analysis and ongoing work. In section 4 we provide a meta analysis of training programs designed to bring women into paid work and test whether their effectiveness depends on the macro context. In section 5 we review evidence from two ongoing projects that aim to quantify the costs of gendered labour allocation on individual firms and the whole economy.

Our first exercise takes a step towards understanding the causes of the gendered division of labour by combining micro evidence with macro data to separate individual and aggregate barriers to women's work. We find that training programs designed to bring women into paid work are effective at increasing female market work only in countries where this is relatively high to begin with. This provides suggestive evidence of whether the low share of women in paid work is the result of individual level barriers (that can be lifted by the intervention) or, rather, it is due to aggregate forces such as social norms that individual level interventions cannot shift. One interpretation of this finding is that social norms display tipping points. It also demonstrates the importance of taking into account the macro context when evaluating micro interventions, to understand why the same intervention succeeds in some places and fails in others.

In section 5 we review two recent attempts at quantifying the cost of allocating jobs by gender, first for a multinational firm operating across countries with different gender norms and second for entire societies. We focus on the costs for aggregate productivity and on the gains that can be obtained by matching individuals with different skills to jobs where the value of those skills is the highest. From this perspective, the main consequence of the gendered division of labour is the talent lost to misallocation. As innate potential for home and market activities is equally distributed by gender, the same people working the same number of hours will produce more if allocated by talent rather than gender. The key implication of gendered work is a link from individual disparities to national income, and, consequently, a rationale for why policies that equalise access to jobs can benefit society as a whole. We conclude, in section 6, by drawing implications for policy and future research.

2 The Jobs of the World Database

2.1 Data Sources and Sample Definition

Our goal is to provide the widest possible coverage of countries and of their people with the smallest number of sources to ensure comparability. We do this by combining two sources, both

[3]There is a large body of work on each and an exhaustive summary is beyond the scope of this paper. For a overview see e.g. Jayachandran, 2015; Olivetti and Petrongolo, 2016; Averett, Hoffman, et al., 2018

publicly available: IPUMS-International (IPUMS) and the Demographic and Health Surveys (DHS).

IPUMS is a collection of microdata from National Censuses covering nearly 100 countries, over several decades, which has been harmonised by and is hosted at the University of Minnesota's Institute for Social Research and Innovation (IPUMS, 2020).[4] The data typically are a 1-%10% random sample of the population census. IPUMS has undertaken a major effort in harmonising the variables to produce a set of recoded variables that are consistent across countries and over time.[5]

DHS are large scale individual surveys. They are part of a USAid program launched in the 1980s to collect nationally representative data on fertility and related women's health issues but also contain modules on household assets and employment for both men and women that have been collected consistently since 1990. For the main dataset we only use DHS surveys that contain employment modules for both genders.[6] The use of DHS to provide micro underpinnings to aggregate analyses has been pioneered by (Young, 2012).

Figure 1 shows that IPUMS and DHS combined cover most of the world. In particular, DHS covers most of Sub-Saharan Africa, which is not covered by IPUMS and hence is often excluded from similar exercises.[7] Because its main focus is fertility, DHS only covers respondents aged 15-49. For comparability we restrict the entire sample to this age group.[8] We take samples from 1990 onward and exclude small countries with a population of less than one million. Older data is available from both sources, but the DHS asset module is not comparable.[9] In the analysis

[4]We thank the national statistical agencies of the countries listed on the website below for producing and sharing the original data: https://international.ipums.org/international/citation_stats_offices.shtml

[5]IPUMS describes the sample design for each census on its website; the most cases the national statistics office provided a sample of the microdata to IPUMS, for example drawing "a systematic sample of every 10th dwelling with a random start.". In other cases, the entire microdata was shared, and the sampling is done equivalently by IPUMS.

[6]Researchers interested in the female samples alone can access it on the JWP website.

[7]With samples for 73 LMICs in the public domain, geographical coverage of the DHS data is extensive, and the most complete for Sub-Saharan Africa. In each of the seven phases of the DHS program, "model questionnaires" form the basis for the questionnaires that are used in each country. Many modules and questions are also repeated from one survey wave to the next. Thus, most survey questions get asked in exactly the same way in all countries included in a given phase of the program, and sometimes across waves as well, making the harmonization process straightforward. The JWD draws on data from DHS "standard" and "continuous" surveys. We exclude all other surveys collected by the DHS program, namely the Multiple Indicator Cluster Surveys (MICS), the Malaria Indicator Surveys (MIS), the AIDS Indicator Surveys (AIS), Malawi's Knowledge, Attitudes and Practices in Health (KAP) survey.

[8]Working age population is generally defined as individuals of age between 15 and 64. This is, for example, the definition adopted by the World Bank and OECD. The ILO adopts a broader definition, categorising as working age all individuals aged 15 and above.

[9]The JWD is constructed via an automated routine that parses raw microdata from the aforementioned sources. When determining the year that each sample refers to, we adopted the convention of using the year in which the first data point of each survey was collected, converted to the Gregorian calendar if necessary. The entire sample will be assigned to that year, even if some data points might have been collected in the following

that follows below, we restrict the data to the latest available year for each country where the variable of interest is not missing. footnoteThe exact number of countries included in each of the analyses below varies slightly. This is explained by differences in variable availability. In this way we avoid putting higher weight on countries with multiple survey/census rounds. However, the JWD contains the full data from 1990 and potential ways to exploit the time dimension of the data abound. The coverage of the full dataset and the data used in this paper are displayed in Figures A.22 and A.23, respectively.

2.2 Variables Definition

The variables included in the JWD include: whether the person reports working, whether their work is remunerated, and whether they are self-employed or in wage work. Appendix Tables A.1 and A.2 provide details on all the variables and how they are constructed. Other important aspects of work are not captured in the JWD because they have not been recorded in the underlying data. These include hours worked, seasonal variation of work, and wages or earnings.

A crucial part of this project is to make sure that work in its different forms is consistently defined and measured. Both IPUMS and DHS follow the definition of work provided in the System of National Accounts, which includes any form of productive activity regardless of whether it generates income for the person engaged in it - e.g. cultivation of crops for own consumption and labour in family enterprises - but excludes labour to supply services inside the home. This differs from the definition of work used by the International Labour Organisation which, since 2013, only includes income generating activities. We further comment on this definition of work below in section 3.

The key advantage of the JWD project is to use the underlying micro data to shed light on how labour market outcomes vary across *and within* countries along multiple socio-demographic dimensions, such as gender, age, educational attainment, or rural vs. urban residence.[10] In addition to demographic variables such as gender and age, a potentially crucial determinant of labour market outcomes is relative wealth.[11] As part of the harmonisation of variables, we therefore constructed a comparable within-country wealth ranking of household.

Wealth in the JWD is constructed as an asset index, following the procedure described in

year. This is the case only for the DHS, as census data provided by IPUMS is usually collected during a single calendar year. Users interested in older IPUMS data points can use the replication code, described in the User Manual (Díaz-Pardo and Smurra, 2022) to produce comparable indicators for earlier years.

[10]The default version of the data contains averages of all work related variables for population groups based on the following characteristics: gender, age in 5 year bins, being a parent, decade of birth, level of formal education, marital status, urban vs. rural residence, wealth quintile (see Table A.1. Throughout, sampling weights are used to ensure that these estimates are nationally representative for the population of interest.

[11]see e.g. Banerjee and Newman, 1993, who make a theoretical case for this claim.

Filmer and Pritchett, 2001.[12] First, we start by identifying all variables recording (i) dwelling quality (e.g. roof and floor material), (ii) ownership of non-productive assets (e.g. radios), and (iii) access to key services (e.g. piped water and electricity). Where possible, we also calculate the ratio of household members per room within the dwelling. We exclude ownership of agricultural land and smaller productive assets. The main reason for this is that only the ranking of households matters for this exercise, and dwelling characteristics and household durables plausibly proxy actual wealth more closely for this purpose than productive assets. For example, rural households tend to hold productive assets in the form of land, while urban households tend to invest more in human capital and financial assets and both of the latter are imperfectly measured in our data sources.

To aggregate the different variables into one index we use factor analysis for each country-year and take the first principal component. We then group people into quintiles based on their rank within their country-year. The wealth index is used to split the population and report aggregate statistics by wealth quintile.

Our wealth measure might itself be affected by the variables of interest such as occupation or urban residence. Wealth is generally considered less responsive to labour outcomes than income, but in the cross-section it would be misleading to treat it as a fixed, predetermined characteristic. The wealth results should therefore be interpreted purely correlational throughout. Note also that a similar concern does not apply to the split by gender which to a first approximation is predetermined and fixed.

To illustrate the use of the wealth grouping, Figure 2 plots three variables typically associated with economic development against GDP - the share working in agriculture, share living in cities, and share with at least secondary education. When the population is split into wealth quintiles large within-country disparities in these variable emerge that dwarf cross-country differences across the whole range of GDP.

All programs used to construct the JWD are available for download on the JWD website at jwd.iza.org. This set of stata-codes provides a user-friendly way to replicate and extend the data. The codes can be customised to produce cleaned microdata or aggregate indicators for different sub-populations. For example, splitting the data by ethnicity/race or parental education might be promising avenues of further analysis. For further details on the data and on how to use the replication codes see the JWD user manual (Díaz-Pardo and Smurra, 2022).

Finally, the labour market statistics from the JWD can be combined with other macroeconomic indicators of interest. For the below analyses, we merge data on annual GDP per capita in constant PPP adjusted USD from the Penn World Tables Version 10.0 (Feenstra, Inklaar, and Timmer, 2015).

[12] The DHS program uses an analogous procedure. https://www.dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm

The next section provides an illustration of how the microdata assembled in the JWD can be used. The scope of the data allows us to document patterns in the organisation of labour across the full arc of economic development. We focus on three aspects of work. First, we broadly document participation in measured work, whether paid or unpaid. Second, we distinguish between self-employed work and wage work. Third, we focus on the types of occupations that are available in the economy.

3 Work along the Development Path

3.1 What is work?

Our objective is to document how work changes at different stages of development. Ideally we would be able to measure all work, defined as any activity to create value that can be done by others (Reid et al., 1934). In practice, however, most surveys, including IPUMS and DHS, refer to work using the definition of work in the System of National Accounts, that is any form of productive activity regardless of whether it is for sale or own consumption. Thus cultivation of crops for consumption counts as "work" while cooking the same crops does not. This effectively creates a distinction between measured work and unmeasured work. When we loosely talk of 'work' we refer to measured work. But it is important to keep in mind that this excludes many activities which create value, in particular services provided within the household. As women take on the major share of such activities, the incomplete measure of work biases official estimates to understate their contribution.

The development process entails two major changes that bear on the organisation of labour: the increasing scale and scope of markets and the creation of firms. Below we split work into paid and unpaid work, which reflects engagement with markets, and into self-employed work and wage work, which relates to the existence of firms. To illustrate, consider a society where households cannot trade with one another. In this society, the use of labour will be entirely determined by consumption needs. In the poorest countries of the world, the poorest people are engaged in this type of subsistence labour that is not traded and not priced. As most labour is employed in the production of food and agriculture is seasonal, people also engage in casual labour, that is a variety of occasional tasks such as washing clothes for richer households. As markets grow, production and consumption decisions can be decoupled and individuals can specialise in producing what they are better suited at, sell it, and use the revenues for purchasing consumption goods. Thus their labour is converted into income. Market work is priced while subsistence work and household work is not, raising difficulties in assessing the value of contribution of the latter. This transition leads to our first dichotomy: unpaid work vs. paid work. As an economy develops, markets grow in scale and scope and people move out

of subsistence and start small income generating activities, which they run on their own or with the help of family members until firms emerge and start offering jobs. The emergence of firms is due to the fact that some profitable transactions cannot be carried out in spot markets because the transaction costs, due for instance to hold-up risk, are prohibitively high. This leads to the second dichotomy: self-employed work vs. wage work. Wage work, which is the most common in high income countries, carries much less risk but also much less autonomy. From the workers perspective, the benefits of a protected contract come at the cost of flexibility, which might be particularly relevant for women with young children (Britto et al., 2022). The distinction between self-employed work and wage work overlaps to some extent with that of informal vs. formal work. The former is better suited to our purposes because it is objective and comparable across countries as it only depends on whether the worker is autonomous or employed by someone else. Formality, in contrast, depends on whether the firm is registered in someway with the state, and registration requirements vary from one country to another, making comparisons difficult especially because formality is more telling about the state's capacity to formalise than the nature of work.[13]

In what follows we will study how these transitions happen during the course of development. Since both transitions are gradual, in the sense that they involve only a share of the population to begin with, we will also study how traits such as wealth and gender affect the order in which people shift between different forms of labour.

3.2 The emergence of markets

Figure 3 plots the share of population engaged in work against log GDP per capita, both in the pooled sample and divided by gender. The solid line represents all work, the dashed lines split total work into paid and unpaid work. In the pooled sample, the relationship between work and development is U shaped. Comparing countries using the World Bank classification by income group, we see that the share in work falls from .67 in the poorest countries to .57 in upper middle income and climbs back to .67 in high income countries.[14]

As markets grow with development, more people are able to sell their output and hence the incidence of paid work rises and unpaid work declines. This can be seen by comparing the dashed to the dotted lines in Figure 3. The share of people in paid work increases slowly from Low to Middle Income Countries (47% to 52%) and then jumps to 67% in High Income

[13]Formality can be defined either at the firm level - a formal firm is registered with a state authority - or at the worker level - a formal worker at the minimum has a contract covered by labour law. In the second sense, formality can also be used as a proxy for the quality of the job. Both of these dimensions can vary across countries with differences in firm regulation and labour law.

[14]On a different sample, Bick, Fuchs-Schündeln, and Lagakos, 2018 also find a drop from low to middle income countries but a smaller uptick for high income countries.

Countries. In contrast, the share of people in unpaid work decreases sharply from Low to Middle Income Countries (20% to 3%) and then peters out to 0.3% in High Income Countries. The combination of these two patterns generates the U-shape in measured work. The fact that in the poorest countries one fifth of the population works without remuneration implies that productivity per paid worker will be higher than productivity per worker, thus care must be taken to disentangle actual changes in productivity from changes in the definition of work in longitudinal data.

The second and third panel of Figure 3 report the share in work split by gender. The split reveals that the U-shape in total work is driven by women, a result going back at least to Goldin, 1995. Interestingly, the decline in women's measured work going from low to middle income countries is driven entirely by the decline in unpaid labour, as first noted by (Schultz, 1990; Schultz, 1991). Paid work for women stays almost constant across low and middle income countries and only increases at high levels of GDP per capita.[15]

While the pattern of unpaid work is remarkably similar across genders, throughout the world men engage more in activities that are measured and in activities that are paid. By contrast to female work, male market work declines as countries get richer thus narrowing the gap.

The three observations of i) a U-shape in work for women which is ii) driven by a decline in unpaid work and an increase in paid work and iii) a decline in men's work, are in line with recent findings on the evolution of the same variables over time in the U.S. (Ngai, Olivetti, and Petrongolo, 2022).

Figure 4 provides further evidence by estimating the relationship between all work and economic development separately in each within-country wealth quintile. Three points are of note. First, in all samples we see that the poorest are more likely to work at low levels of development and the ranking is inverted at high levels. Second, gender is a stronger predictor of the levels of work than wealth: women are less likely to work than men in every wealth class. Third, the U shape for women is mostly driven by women in the two bottom quintiles, whose increase in participation only begins in countries with GDP above $22,000.

Figure 5 repeats the analysis, now only focusing at paid work. As with previous results by wealth, a causal interpretation is complicated. Nevertheless, the striking difference to Figure 4 is that men and women from wealthier households are more likely to do paid work at every level of development. Again, gender matters more than wealth in predicting the variation in paid work. Finally, women in the poorest wealth quintile are the only group that follow a U-shape even in paid work. An increasing share of this groups takes up paid work only at the highest level of economic development.

[15] Estimating a threshold regression model following Hansen, 2000 reveals this break in work-GDP relationship to be around 8,000 USD PPP.

Overall, the microdata reveals that the U-shape in measured work is driven by women, especially for the poorest households in each country. The prevalence of unpaid work declines for all as countries get richer. Men and women from richer households substitute unpaid for paid work. In contrast, women from poorer households 'disappear' from the measured labour force. This is what generates the U-shape in overall measured work for women. A common interpretation of this U-shape is that as countries get richer, women consume more leisure because of the income effect. However, this seems at odds with the fact at in middle-income countries it is the poorest women who drop out of measured work, whilst the richest, who could afford more leisure, do not. To the extend that the U-shape is explained by an income effect, it must be the poorest who are most affected. This might be because the jobs they have access to are very unpleasant. An alternative explanation is that in middle income countries women in poor households must work in the home while their husbands take up paid work on the market. Inability to measure work in the home, might fully explain the U-shape. Without a complete measure of work, as discussed above, we simply don't know its true relationship with economic development.

3.3 The Emergence of Firms

The second aspect of work that undergoes a major transformation as economies become richer is the employment status. In the poorest countries almost everyone is self-employed while in the richest almost everyone has a wage job in an organisation, mostly in firms. This emergence of wage work is shown in Figure 6. Furthermore, the relationship between the share of wage workers and log GDP is S-shaped: it grows slowly at first, then rapidly at middle levels of development and then again converges slowly to nearly 1. By income group, the share doubles from 27% to 60% from Low Income to Lower Middle Income Countries and then it increases to 77% and 87% Upper Middle Income and High Income Countries. In contrast, Figure 3 indicates that the shift from unpaid home production to market happens gradually from the lowest levels element. This suggests that the shift to market labour starts before the shift to wage work.

Being a wage worker means working for an organisation. This organisation is typically either a private firm or the state. Figure 7 shows that while in the poorest countries the state is the main employer, the share of employees in the public sector grows much more slowly than the overall share. The majority of new wage jobs area created outside the public sector suggesting that the process of organisational change is driven mostly by private firms.

The emergence of wage work occurs at the same time and in addition to many of the better known dimensions of economic development, such as structural transformation, urbanisation, and mass education. Figure 8 shows the familiar shift of the workforce from agriculture into manufacturing and services (other sectors) across GDP (panels (a) and (b)). When looking at

the composition within each of these sectors, we find a similar shift from self-employed work to wage work in both. The transition is slower in agriculture but in the richest countries wage work is the dominant form of work in every sector. Along similar lines, Figure 9 shows that the share of people living in urban centres increases over the course of development but the organisation of labour changes at the same rate both in urban and rural areas. Finally, Figure 10 divides the data slightly differently, plotting the share of people in different types of work among people with different educational attainment. Panel (A) shows that measured work increases against GDP for people with secondary and tertiary education, but declines for people with primary or no education - a pattern that mirrors the split by wealth in figure 4. Panels (B) and (C) report shares working in self-employed and wage work, respectively. The denominator is the number of workers with a given educational attainment. In poor and rich countries alike, 80% of workers with tertiary education have a wage job. All other educational groups undergo a shift into wage work, with the lower educational groups experiencing the larger transformations.

The shift of the economy towards wage work affects both men and women and all wealth classes. But as in the case of paid vs. unpaid work important differences arise between these sub-populations. Men enter wage work at a higher rate than women. Since the decline in self-employed work is similar between the two groups, wage work overtakes self-employed work at a lower level of GDP among men (Figure 11). Household wealth also plays a role with wage jobs concentrated among wealthier households, especially in the poorest countries and especially for men (Figure 12). This feeds into the above narrative whereby the poorest in poor countries are the most likely to work - but they work out of necessity and in the worst types of jobs. Both gender and wealth play much less of a role in the allocation of wage work in the richest countries.

3.4 Jobs variety and gendered jobs

Moving up the levels of economic development, an increasing share of the work force shifts from self-employed into wage work in firms.[16] This process of organisational change occurs within all major sectors of production, within rural and urban areas and for most wealth and education groups. Organisational change also affects both men and women, although men enter wage work at lower levels of GDP than women, as discussed in the previous section. But while the shift of labour into firms affects both men and women, it affects them differently.

As labour becomes increasingly concentrated in firms, new opportunities for specialisation arise. Aiming to benefit from division of labour and specific training, ever larger firms create new, more specialised occupations. In places where subsistence agriculture dominates

[16]This section summarises preliminary results from ongoing work on Job Diversification (Bandiera et al., 2022a).

the economy only a handful of different occupations are available, while workers in globalised metropolitan cities can chose from hundreds of different occupations. The increasing fractionalisation of market-work, potentially affects men and women who work outside the household very differently. This section documents the increase in occupational variety over the development path and argues that it is not gender-neutral. The emergence of more specialised occupations coincides with an occupational segregation of the labour force by gender.

The data used for this exercise is an extension of the JWD relying exclusively on harmonised census microdata data provided by IPUMS. The advantage of this data is that it contains individual-level information on an extensive set of occupation variables. There are 84 countries for which such data is available. For a subset of 44 countries, IPUMS has harmonised the occupational categories into the ILO's International Standard Classification of Occupations (ISCO). To allow international comparability, the sample is restricted to these 44 countries.[17] The sample is most severely restricted for the poorest countries where IPUMS data is less available. However, the patterns we document below, become most relevant in richer places where a large share of work already occurs in firms.

IPUMS recodes occupations based on the raw occupation variable used by each country's census bureau. While some countries have adopted ISCO, many follow their own classification. Where possible, IPUMS has coded occupations consistently in the 3-digit ISCO 88 classification. The ISCO 88 classification contains 9 major groups (plus armed forces) and 116 possible minor groups at the 3-digit level.[18] ILO's guiding principle in grouping occupations is the similarity of skills required to fulfil the tasks of the job. Both skill level and skill specialisation are taken into account.

Figure 13 reports the share of workers in each of the 9 ISCO major groups. The first panel shows the combined shares for all workers. We see evidence of a well known shift out of agriculture into all other forms of occupation. In particular, the high skilled groups (managers and senior officials, professionals, technicians) claim an increasing share of the workforce as countries get richer. With increased industrialisation, naturally the share of machine operators also decreases. The second and third panel reveal that the composition of work is increasingly gendered in richer countries. Throughout women tend to work more in services and men more in crafts. But these shares increase at higher levels of income. Further, women move increasingly into professional, technical, and clerical jobs, while men drive the increased share of legislators and machine operators.

[17] We apply the same sample restrictions as described for the JWD in section 2 above, including respondents' age to be between 15-49.

[18] The classification allows further differentiation into 390 'Unit Groups' at the 4-digit level. For further details on ISCO 88 see Hoffmann, 2003. In a few cases of earlier census rounds the occupation variable is based on the 1968 ISCO classification. In these cases were converted to ISCO 88 using the stata command `iscogen` (Jann, 2019).

As a measure of job variety, we simply count the number of ISCO minor groups occupied by individuals in a country. To reduce measurement error, and avoid counting occupations that occur extremely rarely, we only count an occupation if it has at least 0.1 percent of the workforce.[19]

Figure 14a plots the count of different occupations against countries' log GDP per capita in the year when the census data was recorded. The sample, though severely restricted by data availability still spans a large range of economic development from Ethiopia with per capita GDP of USD 660 in 1994 to Switzerland with per capita GDP of USD 64,000 in 2000. There is a clear positive association between the size of the economy and the number of jobs available to a typical worker. In the richest countries, there are more than four times more occupation types than in the poorest. As with the shift into wage work, increased specialisation among employees occurs for both men and women.

The emergence of new jobs as the economy becomes more complex seems entirely due to people coming together in organisations. Figure 14b splits workers into self-employed and wage workers. It shows that the larger number of occupations in rich countries is exclusively held by workers in wage work. The number of occupations available in self-employed work stays constant across all levels of economic development.

There are several explanations for the rise in job variety that accompanies economic development. Rich countries employ more advanced technologies creating new technical jobs. Better education systems provide opportunities for specialised education. The larger scale of production makes increasing division of labour profitable. Conversely, more specialised jobs can boost productivity by facilitating on-the-job training and better matches between workers' specific interests and skills on the one hand and the performed tasks on the other. Whichever explanation applies, Figure 14b points to the importance of organisations in this process. It is firms that adopt new technologies, create specialised occupations and manage the division of labour by allocating tasks to workers.

Interestingly, as the next result shows, the newly created job categories are not taken up by men and women in equal shares. As job variety grows, jobs become more gendered. The patterns in Figure 13 already indicate that men and women enter into different types of occupations as countries become richer. We can use the 3-digit in ISCO minor groups to demonstrate that the same pattern holds across a much more detailed occupational classification. We measure occupational segregation across genders using a simple dissimilarity index (O. D. Duncan and B. Duncan, 1955). Occupational segregation for country i is defined as

[19]This threshold is arbitrary but our results are robust to using 0.5% or 1% instead. The results also broadly hold when using an Index of Job Fractionalisation, defined as $Frac_i = 1 - \sum_j \left(\frac{w_{j,i}}{W_i}\right)^2$, where $w_{j,i}$ is the number of workers in occupation j in country i and W_i is the size of the labour force in country i.

$$D_i = \sum_j \frac{2w_{j,i}}{W_i} |\pi_{j,i} - \pi_i| \tag{1}$$

where W_i is the size of the labour force in country i, $w_{j,i}$ is the number of workers in minor occupation group j in country i, π_i is the share of women in the labour force, and $\pi_{j,i}$ is the share of women in occupation j. Intuitively, there is little segregation if the share of women (or men) in each occupation equals its share in the overall labour force. The index ranges from 0 to 1 and can be interpreted as the share of women (or men) that would have to change occupations in order to equalise female representation across occupations.

As figure 15 illustrates, there is a clear positive association between variety and segregation of jobs. In places where more occupations are available, they will be more strongly dominated by either men or women.

As an example of this, consider the care sector. We code care work manually from the ISCO 88 tables.[20] Figure 16 plots the share of care workers that are women against GDP per capita. As countries become richer, care tasks are increasingly taken on by women.

4 Norms: A cross-country analysis of RCTs

The evidence above makes clear that labour is organised along gender lines. This pattern coincides with the growth of markets and continues throughout the process of development. More surprisingly, it is women in the poorest households who are least likely to have a paid job outside the home in most countries except for the very richest in our sample. As discussed earlier, the income effect is the weakest for this group and yet, on average, twice as many women from the top quintile of household wealth as from the bottom quintile are in any form of paid work. The equivalent ratio for men is 1.3. Within this context it is not surprising that several development interventions such as training programs and cash transfers target the possible barriers that prevent women from working outside the home. In what follows we collect the estimated treatment effects on the extensive margin of labour supply (that is whether women have a paid job) in countries where these interventions have been implemented and evaluated. We then combine these with our macro data on the share of women in paid work to provide evidence on whether low shares are the result of individual level barriers (that can be lifted by the intervention) or, rather, it is due to aggregate forces such as social norms that individual level interventions cannot shift. The intuition is simple: if we observe low shares because of individual barriers to labour supply we should find that interventions are more effective

[20] The following job descriptions are classified as care work: Health, nursing, midwifery and teaching professionals and associate professionals, social work associate professionals, housekeeping and restaurant services workers, personal care and related workers, domestic and related helpers, cleaners and launderers.

in countries where the women's share is low to start with because most beneficiaries will be responsive to treatment, whereas in countries where the share is high and thus it is possible for women to work, targeting those who choose not to is unlikely to make a difference. However, the logic is reversed if low engagement is symptomatic of social norms. In this case, most development interventions which are too small to shift social norms are unlikely to succeed in places with low share because they target the symptom rather than factors that underpin the norm.

The idea that social norms play a crucial role would be consistent with the fact that participation in market work varies enormously even within countries with very similar level of income. For example, the interquartile range of the share of women who hold paid jobs is around 20 percentage points within every decile of GDP. The dispersion is highest in the lowest decile of GDP at 25 percentage points, and only 10 percentage points in the highest decile. Differences between minima and maxima are as large as 80 percentage points for most deciles.

We look for all interventions aimed at increasing women's participation in Low and Middle income labour markets, and impose the following restrictions: (i) that the intervention is evaluated using experimental methods; (ii) that the results are published in a peer-reviewed journal in economics or in a vetted working paper series (BREAD, CEPR, IZA, NBER, WB) after 2010; (iii) that both the coefficient and standard error of the treatment variable are reported. Overall we identify 41 interventions aimed at increasing labour force participation for women across 22 countries[21], as well as 23 interventions targeted to men across 15 countries[22]. For the women (men) sample, 5 (5) of the considered articles have been published in top-5 journals for the economic profession, 25 (13) are other peer-reviewed publications, while 11 (5) are working papers. In addition to our pre-existing knowledge on the topic, we rely on previous meta-analyses on active labour market policies to select the sample of studies considered (Buvinić and Furst-Nichols, 2016; Card, Kluve, and Weber, 2018; Crépon and Van Den Berg, 2016; McKenzie, 2017). Throughout we focus on the extensive margin of engagement in paid work for comparability. The measure of the treatment effect concerns either (i) the women (men) sample separately, or (ii) the aggregated sample, with the specification in the paper that there is no evidence of heterogeneity on gender lines. For papers that report treatment effects at different horizons we always opt for endline measures, and opt for ITT over LATE because the take-up decision is part of the effect of interest. Tables B.3-B.9 in Appendix B report all the papers that meet the requirements above. For the women sample we have 73 estimates from 41 papers. Of these, the single largest group is vocational training (41 estimates, 23 papers),

[21]Brazil, Chile, Colombia, Dominican Republic, Egypt, Ethiopia, India, Jordan, Kenya, Liberia, Malawi, Mexico, Mongolia,Perù, Rwanda, Sierra Leone, Sri Lanka, Tanzania, Tunisia, Turkey, Uganda

[22]Brazil, Colombia, Dominican Republic, Ethiopia, India, Kenya, Malawi, Mongolia, Nepal, Peru, Rwanda, Sierra Leone, Tunisia, Turkey, Uganda

followed by cash transfers (13, 6) and schooling (3,3). It is interesting that none of these interventions target men who might be the barrier between women and work. For comparability we focus on vocational training programs in what follows. Figure 17 shows the bin scatter of t-statistic on the extensive margin of labour supply against the share of women in paid work. As discussed, we expect this line to be flat or negatively sloped if the programs target women who are unable to find jobs because of lack of skills. In contrast the figure shows a clearly positive relationship, namely, programs are more effective in countries where the share of women in paid work is high to start with. This is consistent with the existence of a norm that the program is too small to shift.

To corroborate our interpretation of gender specific norms, Figure 18a shows there is no systematic correlation between the RCT results for women and the share of *men* in paid work thus ruling out that labour market wide factor are driving the different effects. In Figure 18b, we replicate the analysis for men and, again, we find no correlation. Although the evidence is far from being conclusive, it illustrates the potential of using the macro variation to explain differences in the effectiveness of similar programs implemented in different countries.

Norms can be self-stabilising as people may go against their own preferences if breaking the norm is very costly. The cost depends on one's beliefs about other people respect for the norm. There is some evidence that these might be overstated, and that people would not adhere to the norm if they knew the real preferences of others (Bursztyn, González, and Yanagizawa-Drott, 2020; Bursztyn and Yang, 2022). In these cases, information campaigns can change the equilibrium quite quickly and it would be interesting to evaluate the combination of training with norm-busting information.

While there is a rich literature on the origins of gender norms (Alesina, Giuliano, and Nunn, 2013; Boserup, 1970), much less is known about what keeps them alive today and why they differ greatly even among similar societies. A prominent example is the gender allocation of childcare responsibilities. A recent body of work (Kleven, Landais, and Søgaard, 2019; Kleven et al., 2019) suggests that in several high income countries female labour force participation, and earnings drop after the arrival of the first child. Estimated penalties range between 21% in Denmark to 60% in Germany. Extensions to low and middle income countries (Kleven, Landais, and Leite Mariante, 2022) show even more variation both in the levels and, perhaps more importantly, in the duration of the penalty and hence its cumulative cost. More detailed evidence from Chile and Brazil shows that the availability of informal work partially counteracts the child penalty, and mothers start returning to the labour force 5 years after birth but they still pay for the flexibility because formal jobs offer better conditions on any other dimension. (Britto et al., 2022; Berniell et al., 2021).

5 The efficiency cost of gendered occupations

The benefits of a gender neutral allocation of labour are both intrinsic and instrumental. Gender neutrality has intrinsic value for women's freedom and well being. In most societies, social status, educational and economic opportunities, financial independence and political power are all closely linked to paid work in the market, and especially wage work. As long as unpaid home production is not afforded the same benefits, the access to jobs remains a question not only of efficiency but also of distributive justice.

Gender neutrality can also improve economic efficiency through two channels. The first is that by moving women from home production to market production, labour supply might increase overall (Lewis, 1954). The second is that it might improve the match between people's skill endowments and jobs' skill requirements. A better match improves productivity by exploiting complementarities for a given level of human capital in the short run and also by strengthening incentives to accumulate more human capital in the long run.

Existing estimates of the effect of closing the gender gap in market work quantify the labour supply channel (OECD 2012). As women join the labour market, the number of measured market transactions increases, even more so if they outsource household work to others thus creating an additional, measured, market transaction. This increase in measured labour supply is typically translated into increases in GDP and growth using production function estimates. Whether this is desirable depends on whether actual labour supply increases and, if so, at which cost. If the increase in market supply is met by a one-to-one fall in home supply, *measured* labour supply increases but *actual* labour supply is effectively constant. In this case the estimated increase in GDP will overstate the increase in actual output and welfare as the decline in home production remains unmeasured. If, at the other extreme, women supply labour to the market without decreasing the labour supplied at home, the increase in GDP reflects an increase in actual output but, again, not in welfare because it does not take into account the cost of the additional hours of labour supplied by women.

Women entering the labour market can also affect the composition of those who work inside and outside the home. The resulting reallocation of workers to tasks (both within the household and on the market) can affect productivity, i.e. income *per work*. In particular, the match between skills an job characteristics can improve in three ways: women taking up work in the market sector, men working in the household instead, and household work being outsourced to the market. Contrary to the model where the woman stays home and provides services that are not marketed and hence not priced, the market for domestic help will have the added benefit of pricing household chores and potentially improving their allocation.

We discuss two studies that illustrate this productivity gain from female selection into the labour force at the macro level. Using historical data from the United States, Hsieh et al.,

2019 argue that the entry of women and black workers into occupations from which they were historically excluded improved the overall allocation of talent. They estimate that the decline in entry barriers for these groups can account for one 20%-40% of growth in US GDP per person between 1960 and 2010.

A related way to view the same problem in the cross section, originates with the crucial insight in Olivetti and Petrongolo, 2008 that gender pay gaps and employment gaps are negatively correlated across countries. The authors argue that this could be a result of sorting into the labour force based on ability: "if women who are employed tend to have relatively high-wage characteristics, low female employment rates may become consistent with low gender wage gaps simply because low-wage women would not feature in the observed wage distribution" (p. 622). Facing disproportionately higher barriers to entry into the labour market, only women with high returns end up working outside the household.

Positive selection of talented women would imply that the average productivity of women observed in the labour market exceeds that of men. Bringing additional women into paid work increases the average skills of market workers. It also implies that the skill-adjusted wage gap would be much higher than the gap in observed wages, especially in countries with low female labour force participation. This hypothesis thus links observed differences in average wages and labour market participation to misallocation of talent between the home and market sector.

However, aggregate wages are an imperfect measure of productivity, as women work in a different set of occupation than men. And as demonstrated above, gender segregation of jobs varies across development. Looking at aggregate data therefore leaves room for alternative explanations relating to the composition of the market workforce. A more direct test of the positive selection hypothesis can be achieved by studying the effect of aggregate female labour force participation on the productivity of male and female workers in a single firm. This is what we discuss next.

5.1 The cost of gendered work for firms

Ashraf et al., 2022 cooperate with a large multinational enterprise (MNE) that operates in 100+ countries spanning a large range of national female labour force participation rates. The personnel data covers the universe of white collar, regular, local employees - a total sample of 100,000 workers - over 5 years between 2015 to 2019. Standardized educational requirements for these positions lead to a homogeneous workforce. The majority of employees have a degree in business administration or engineering. Typical jobs involve sales, product development, marketing and general managerial activities

Within this sample, industry and job type are fixed and wage scales are defined consistently. Worker and job characteristics like experience, tenure and function can be controlled for. The

observed wages arguably provide a more accurate comparison of worker productivity across countries than aggregate wage data. The time dimension of the data means that even within the same country variation in FLFP can be exploited across cohorts.

Another advantage of using data from a single firm is that it rules out concerns about reverse causality - the idea that income and productivity growth can affect aggregate FLFP, for example through modernisation of norms.

The wage microdata from one firm and narrow job classification confirms the cross country picture: The gender pay gap is smaller in places where aggregate female labour force participation is lower. In places with the lowest female labour force participation, the gender pay gap is inverted - women earn more than men with the same experience, same tenure and working in the same function. Women are more positively selected into the workforce than men, and more so in places where barriers to entry are highest.[23] Importantly, this selection is not fully captured by observable characteristics. A typical women who made it in the firm has faced more barriers in the form of social norms and discrimination (and has foregone better opportunities for home production) than a man with equivalent observable education and experience. The fact that she has nevertheless reached this position is an indication that she has unobserved characteristics that make her particularly suited to the job.

This finding indicates substantial misallocation in places with low FLFP. A marginal women who would enter the firm instead of working at home is more qualified than the marginally employed men. To quantify this misallocation, the paper estimates a structural model of the firm pay policy. This separately identifies gender differences in fixed pay, which could be due to discrimination, from differences in variable pay, which are more likely to reflect different productivity. Consistent with positive selection, estimated productivity inside the firm is higher for women than for men. And in line with the pay gap, the productivity gap closes as female labour force participation increases.

A counterfactual simulation which sets equal the female and male labour force participation rates, induces substantial re-sorting, particularly in places with low initial FLFP. The replacement of low ability men by higher ability women induces productivity gains even holding constant the total number of workers. While there is large heterogeneity across countries, elimination of barriers to labour market entry outside the firm would on average increase firm productivity by 32%.

Focusing on one firm and one skill group makes interpretation easy, but raises concerns of generalisability. Ashraf et al., 2022 use balance sheet data from 2 million firms in ORBIS to show that their misallocation estimates correlate with the productivity of other firms, especially in related sectors.

[23]The same relationship holds within country across cohorts and within cohort across countries.

5.2 The cost of gendered work for society

An alternative way to assess the misallocation from gendered jobs is to directly measure the match between the skill requirements of a job and the skill of the worker. We can then ask how this match varies by gender. This approach, is pursued by Bandiera et al., 2022b. It requires data on worker skill and on the skill requirement of jobs. The availability of data on adult skills in particular restricts the geographic and historical scope of this exercise.

Adult skill data is available from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC). PIAAC conducts interviews to test key cognitive and workplace skills such as numeracy, literacy and digital problem solving. The questions are designed to be internationally comparable and the sample covers 227,000 adults representative of the working population in 35 countries between 2011-2017.

This data is merged with occupation data from O*NET, which contains information on the skill requirements of different jobs. O*NET provides scores on 128 skill requirements for each of 873 occupations. These multidimensional skill requirements are reduced into three scores, numeracy, literacy and problem-solving skills, following the factor analysis-based approach by Lise and Postel-Vinay, 2020 and Lindenlaub and Postel-Vinay, 2021. The below results focus only on numeracy skill for both worker skills endowments and job skill requirements.

The resulting data set contains countries in Europe, North and South America, Central and East Asia, with GDP per capita ranging from around 5,600 USD in Ecuador to 67,300 USD in Norway. As in other data sources, household work - crucial for the assessment of gender misallocation - is not recorded. To address this, the skill requirement of people reporting to be homemakers is computed as the average of teacher, nurse, cook and maid.

The paper illustrates the match between worker skills and skill requirements by plotting the density of workers in a heatmap of the endowment-requirement space (E.g. Figures 19 and 20). Skill requirements and worker skills are grouped by within-country deciles. This relative definition of skill is useful for this exercise, where we don't care much about absolute differences - the most demanding job within a country should be performed by the highest skilled worker of that country, and so on. The degree of matching between worker skills (on the horizontal axis) and skill requirement (on the vertical axis) can be assessed by how strongly the mass of workers concentrates along the main diagonal of the map. High density areas are coloured in red and yellow, while low density and empty areas are coloured in green and dark blue.

In a society that could be termed perfectly meritocratic every person works in a job that requires exactly the level of skill that they have. One country close to this ideal is Singapore. As shown in figure 19, the distribution of both men and women concentrates around the diagonal, with most people working in a job not far from their skill level. Women's jobs match their skill throughout the distribution, although there is slightly more dispersion around the diagonal at

higher skill levels. For men, there are two areas of high density, low skilled workers working in low skilled jobs and high skilled workers working in high skilled jobs.

A contrary example is Korea, shown in figure 20. Almost all women work in a job of medium skill requirement, which in this case corresponds to the imputed skill level of housework. Even among women with the highest skill level, most are found in this job category. Strikingly, these women completely crowd out any male labour in this skill segment: No men are found in these jobs. Instead, some highly skilled men are found in very low skill jobs and more worryingly, some relatively low skilled men are found in jobs with the highest skill requirement.

The mismatch between jobs and skills also shows in the aggregate population, but splitting these figures by gender highlights that a large fraction of the aggregate mismatch is accounted for by a mismatch within gender. Interestingly, Figure 20 also illustrates how a misallocation of women can affect the allocation of men. If high skilled women are constrained to working in house keeping, some of the most difficult jobs have to be taken on by underqualified men.

For a more systematic cross country analysis, the information contained in these heatmaps must be summarised into a single index. The paper defines a Meritocracy Index as a measure of assortative matching between job characteristics and worker characteristics. Focusing on skills, the index captures the absolute distance between job requirement and worker endowment summed across all workers and normalised to fall between 0 and 1.[24]

Figure 21 shows a scatter plot of the overall Meritocracy Index against the share of women in paid work.[25] There are too few countries to draw definitive conclusions. But a few patterns might be cautiously detected. There seem to be broadly three groups of countries. First, countries with few women in paid work that score low on the meritocracy index. Among countries with a high share of women in paid work there are many with a meritocracy score and a few countries with a very low score. (kazakhstan, Russia, and Slovakia which share a communist history stand out in this group). Notably, there are no countries with low FLFP that score high on the meritocracy index. This evidence is at best suggestive. But it is consistent with the view that women entering paid work has in some places contributed to an improved

[24]Formally, we have a set of M workers matched with M jobs, both indexed by $i = 1, ..., M$. Denote worker i's skill endowment by x_i and the skill requirement of their job by y_i. Let G denote the cumulative distribution function (CDF) of x and H denote the CDF of y. The meritocracy index, μ, is defined by

$$\mu = 1 - 2\sum_{i}^{M} |G(x_i) - H(x_i)|$$

The index is bound by $\mu = 0$ and $\mu = 1$, which obtains when there is perfectly negative or positive assortative matching, respectively. Under random matching the index is $\mu = \frac{1}{3}$.

[25]Here we draw on labor force participation data from the International Labour Organisation as some of the countries covered by Bandiera et al., 2022b are not in the JWD. For consistency, we use ILO data for all countries. Since most datapoints are after 2013 and these are mostly rich countries the ILO's labor force participation statistic corresponds closely to the measure of paid work in the rest of this paper.

allocation of talent for both men and women.

6 Conclusion

We have documented how the organisation of work changes over the course of development from individuals or households producing mostly for their own consumption to the emergence of markets where each individual producer can specialise in one product and exchange it for others, to the emergence of firms that hire most of the labour in the economy and create increasingly specialised occupations. We then argued that wealth and gender shape the allocation of jobs at every stage of development and discussed evidence that this can lead to misallocation and efficiency losses. Our findings raise new questions for future research, both substantive and methodological.

The substantive issues that need more attention are the following. First, the study of the allocation of labour is in its infancy (compared, for instance, to the allocation of capital), and besides gender and wealth there are other traits orthogonal to skills that determine occupational choice, such parents' occupation or caste (Bell et al., 2019; Alesina et al., 2021).

Second is the design of policies that can lead to a better allocation. In general, a major drawback of several policies that aim to bring equality between genders is that they treat both equally, while others reinforce gender roles. One prominent example of the latter is parental leave policy that, in most countries, awards much longer periods of paid leave to mothers relative to fathers, effectively making it cheaper for women to take time out. In the workplace, however, differential treatment by gender is often unlawful, which protects from discrimination but at the same time rules out practices that could iron out the inequality induced by family policies. A well known example in academia is the practice of stopping the tenure clock for each child that was introduced with the goal of allowing women to make up for their time on maternity leave, and that ended up increasing the gender gap in tenure rates because fathers could not be excluded from benefiting (Antecol, Bedard, and Stearns, 2018). Only policies that target outcomes experienced by the actual carer, for instance training or other interventions to facilitate re-entry in the labour force after time out due to the birth of a child, will achieve the desired effect. A related, and vastly understudied, issue is that of women re-entry in paid work once their reproductive cycle is concluded. At current fertility rates, birth spacing, and life expectancy most women in the world could restart a long career after their children have reached school age, injecting talent back into the economy. It is surprising that most policies focus on the early years of childcare, which are -by definition- short, rather than the long period after that.

On the methodological front, we cannot overstate the importance of taking into account

the local context when designing policies. We provided one example of this, but the growth of randomised evaluations across the world provides plenty of room to do more.

More importantly, the changing nature of the economy poses important challenges to the measurement of work. As we discuss in detail, the emergence and growth of markets for goods and services leads to an increase in measured labour exchanges even if the actual labour input is unchanged. This parallels a common critique of GDP excluding all household production that is not sold on the market (e.g. Feldstein, 2017). While we capture some forms of unpaid work, many goods and all services produced in the household remain unrecorded. As is well known, the productive activities of women both in terms of quantity and value are severely underestimated, and it seems particularly true for women in the poorest households. Changes in technology and custom, for instance the raise in the incidence of working from home, pose future challenges to correctly measuring women's work.

Without information on time use we cannot possibly measure total work input, which is necessary to compute labour productivity. If paid work were representative of all work, productivity in the market, which can be easily estimated as we know the total value of the product of labour, would be a good proxy for productivity overall. However, until we measure non-market work, we will not know whether the market sector is representative and there are at least two reasons why it might not be. First, the share of women in market work is lower, indicating systematic selection. Second, there are plausibly complementarities between the home sector and the market sector: the services provided within the home contribute to the human capital of family members currently working and to that of the next generation. Measuring all activities that can be delegated to a third party is the only way to know the true productivity of labour and to assess whether its allocation is optimal.

Recent development in labour markets in high income countries suggest that we cannot rely on the fact that most people will eventually be in the market sector. Indeed the data suggests that work is becoming increasingly fragmented and in recent years, self-employment has made a return in the form of zero-hour contracts (Boeri et al., 2020) in many high income countries. We must develop accurate measures of work time and quality, broadly defined, if we are to understand the causes of this change and its consequences for the level and the distribution of the product of labour.

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7 Figures

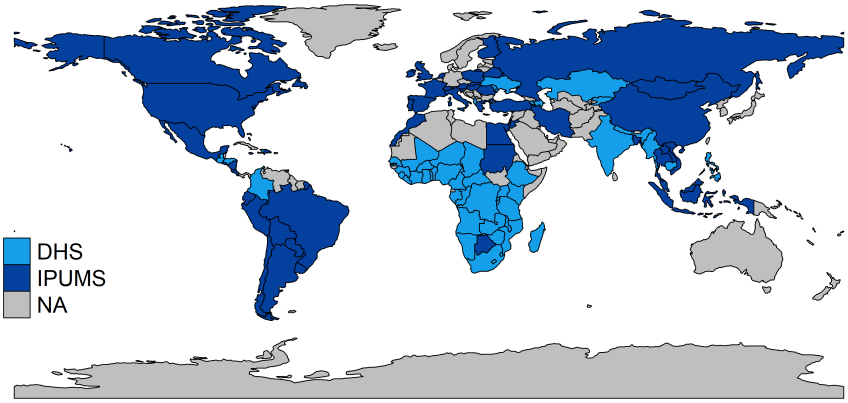


Figure 1: Countries in JWD

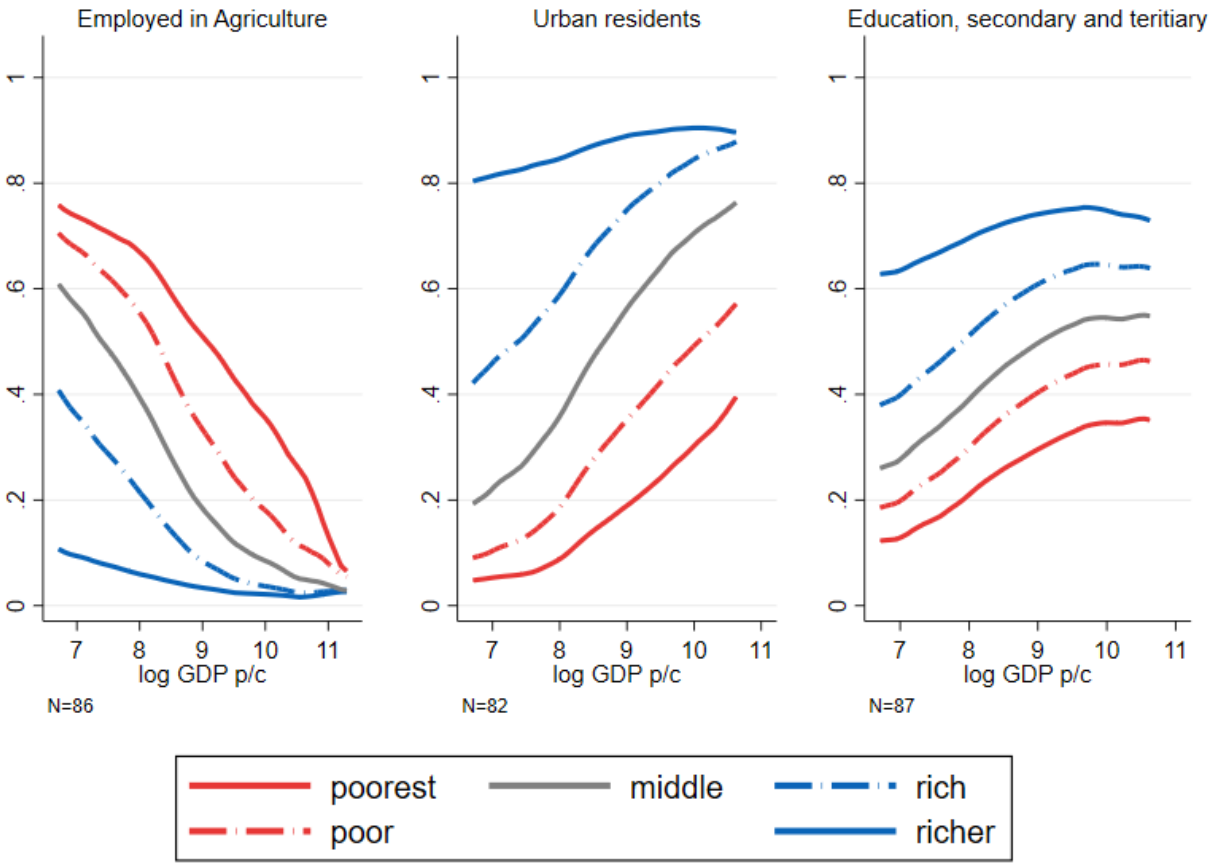


Figure 2: Inequality within and across countries

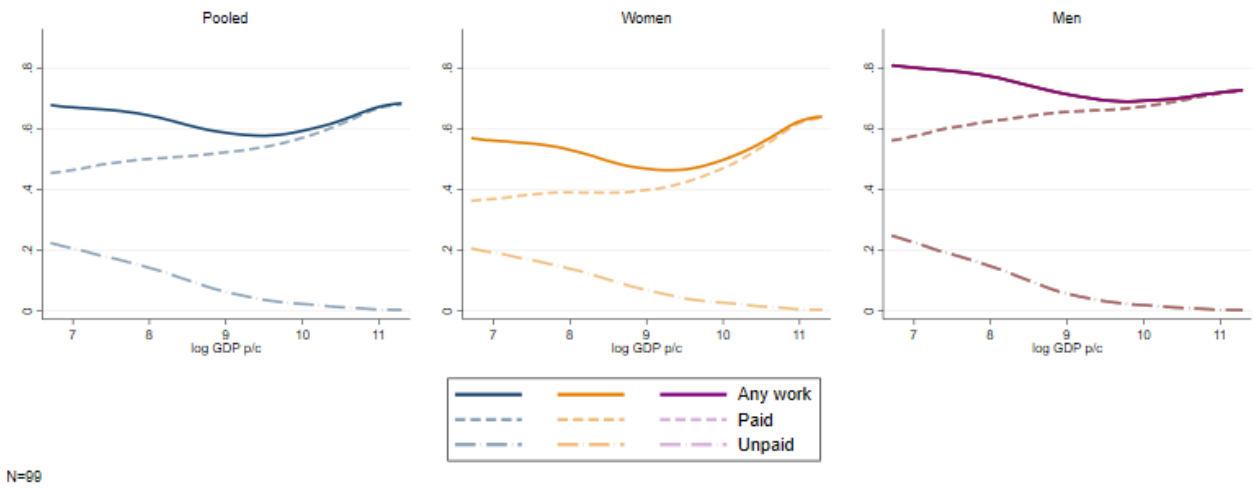


Figure 3: Paid and unpaid work against log GDP per capita by gender

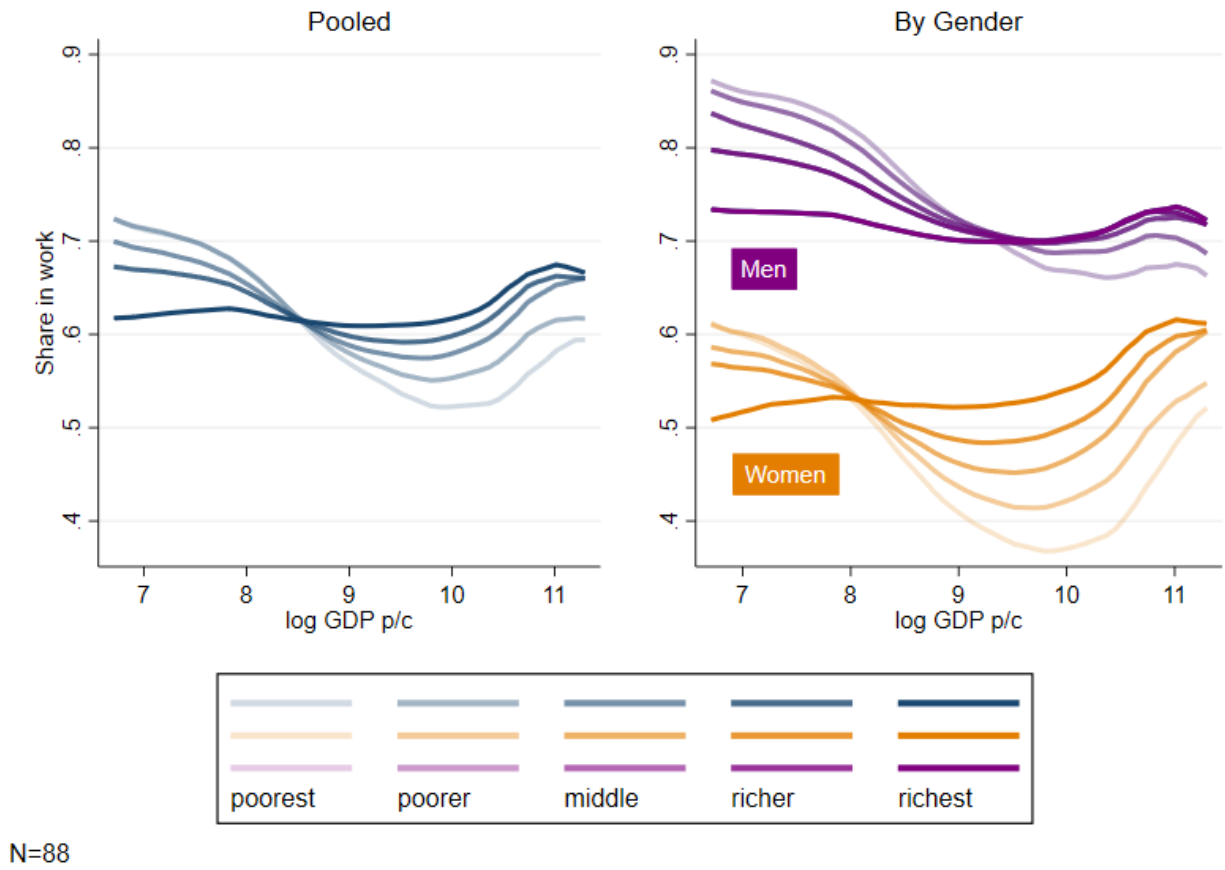


Figure 4: Share in work against log GDP per capita by gender and wealth

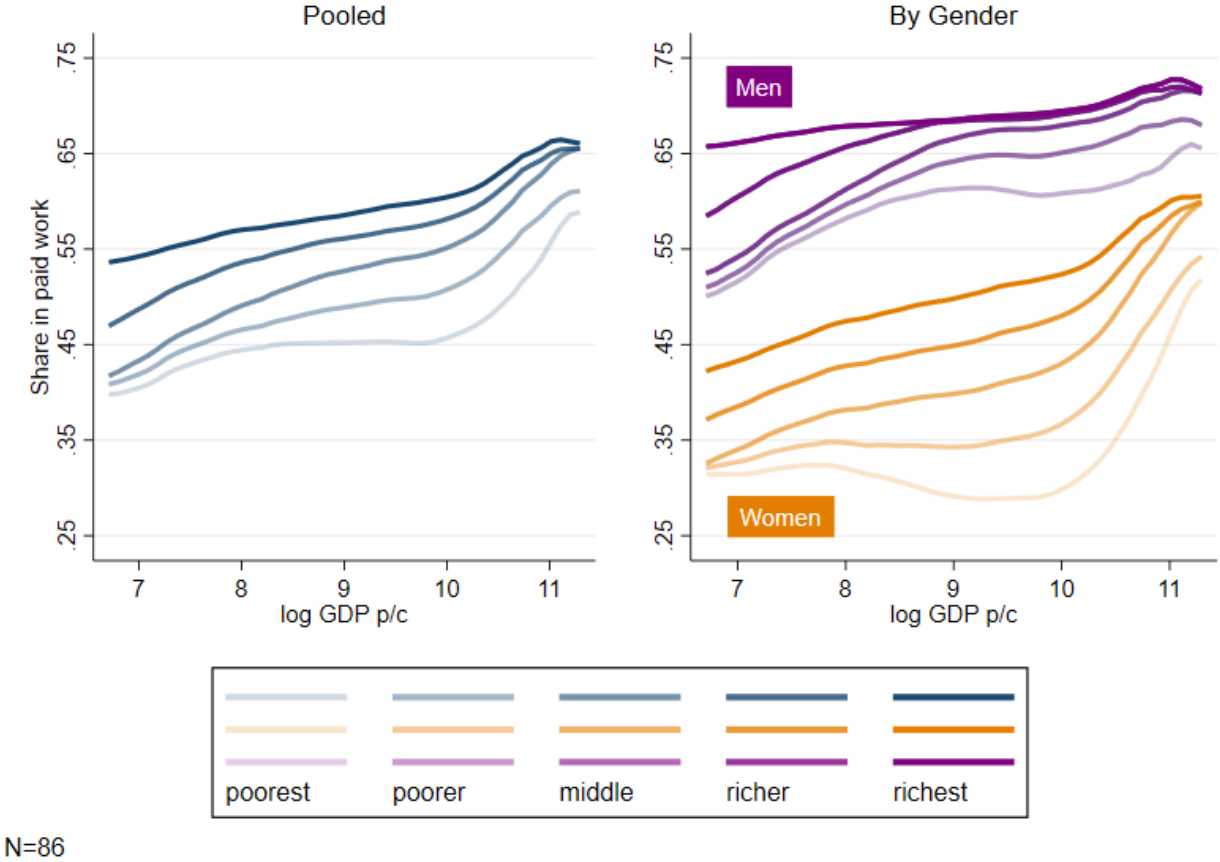


Figure 5: Paid work against log GDP per capita by gender and wealth

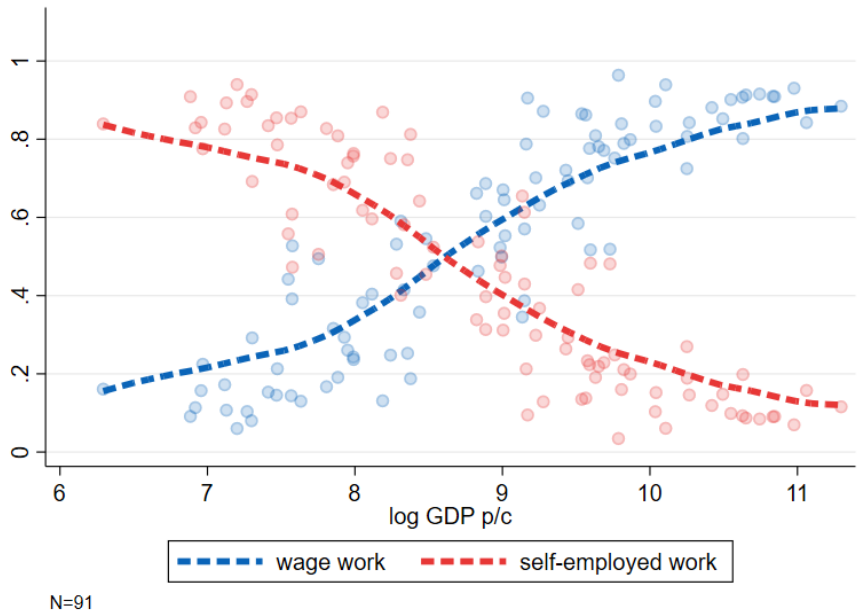


Figure 6: Share in self-employed work and wage work against log GDP per capita

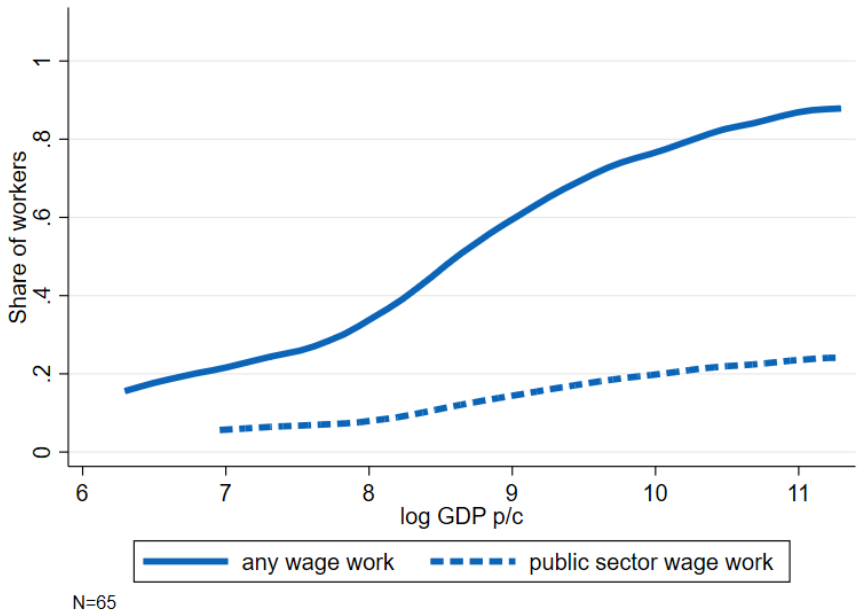


Figure 7: Share in wage work overall and in the public sector

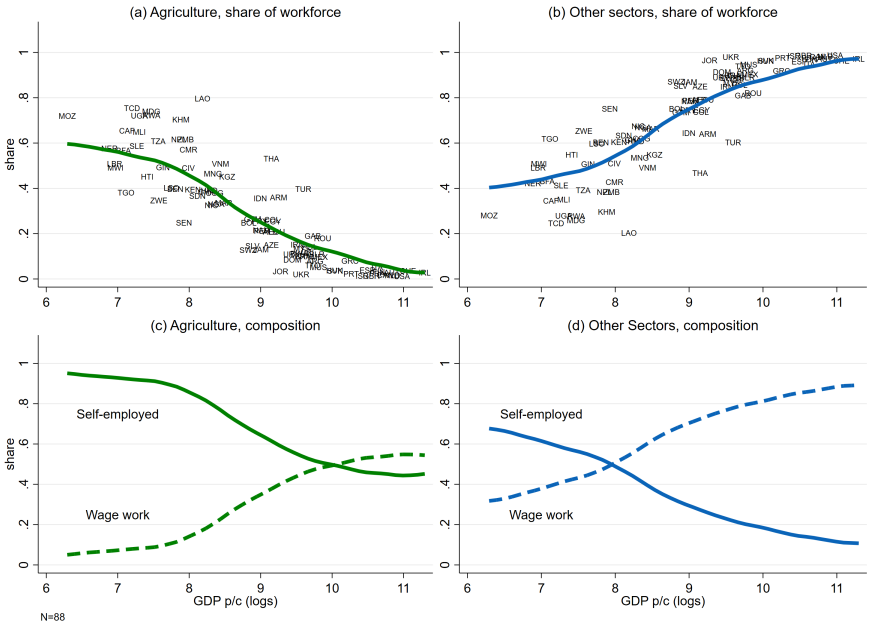


Figure 8: Structural transformation and wage work

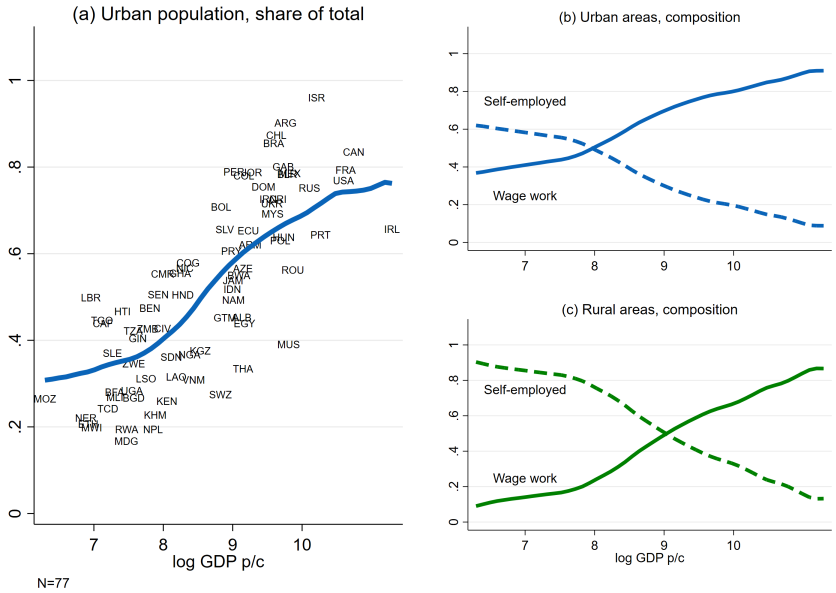


Figure 9: Share in wage work against log GDP per capita by gender

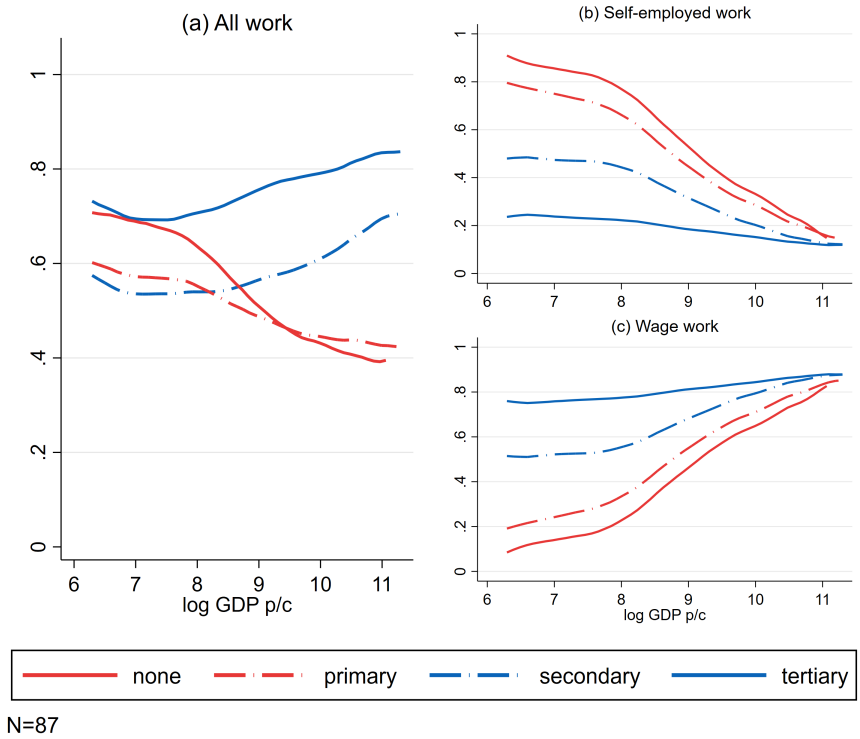


Figure 10: Share in wage work against log GDP per capita by gender

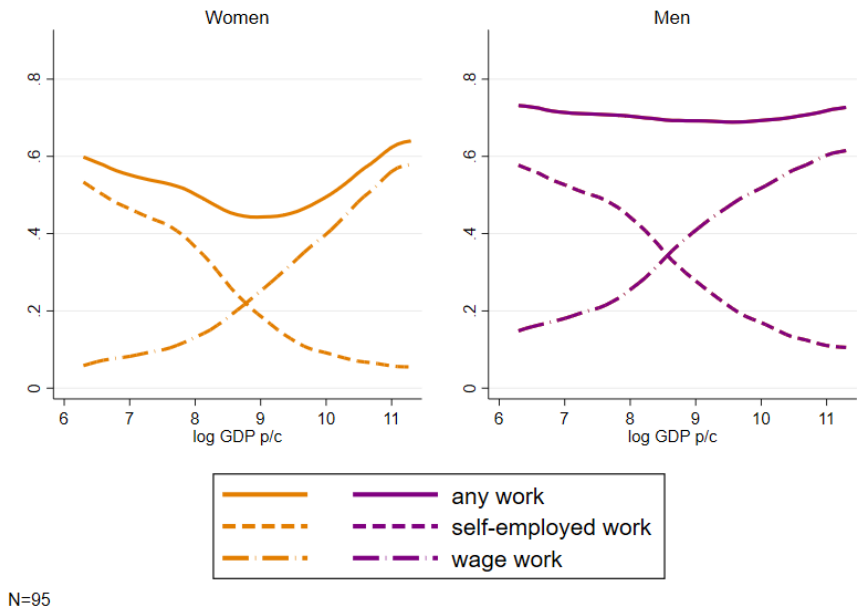


Figure 11: Wage work against log GDP per capita by gender

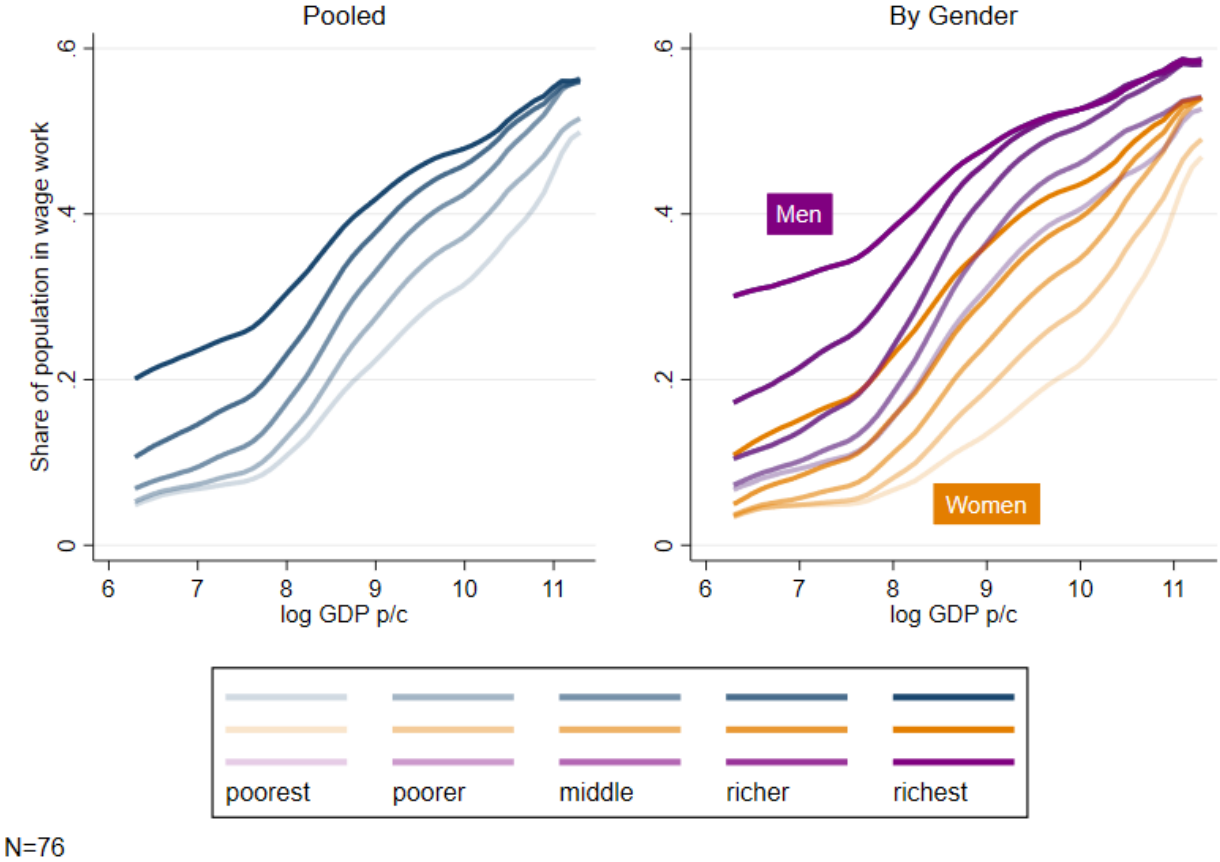


Figure 12: Wage work against log GDP per capita by gender and wealth

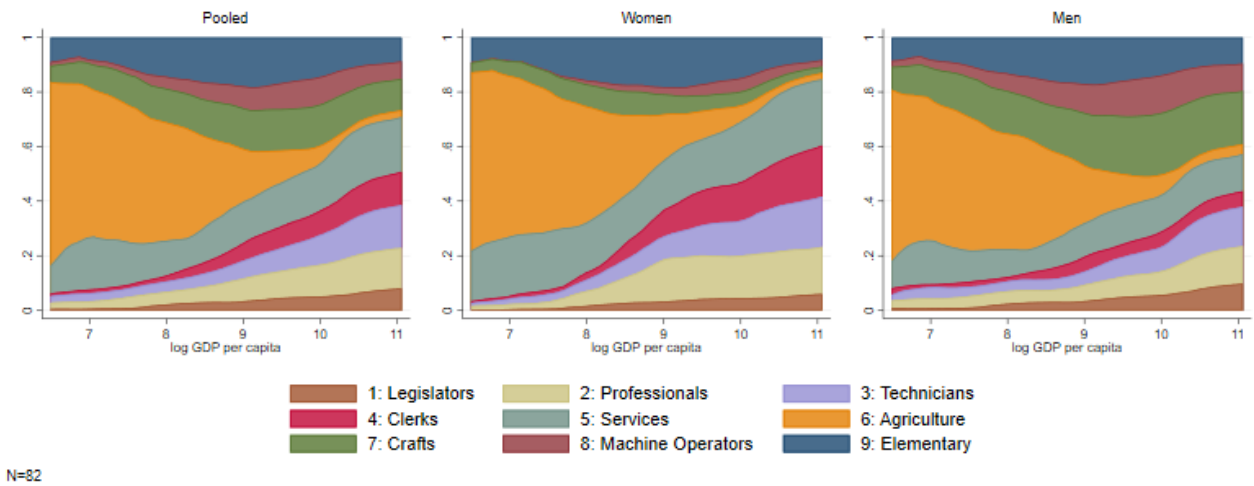
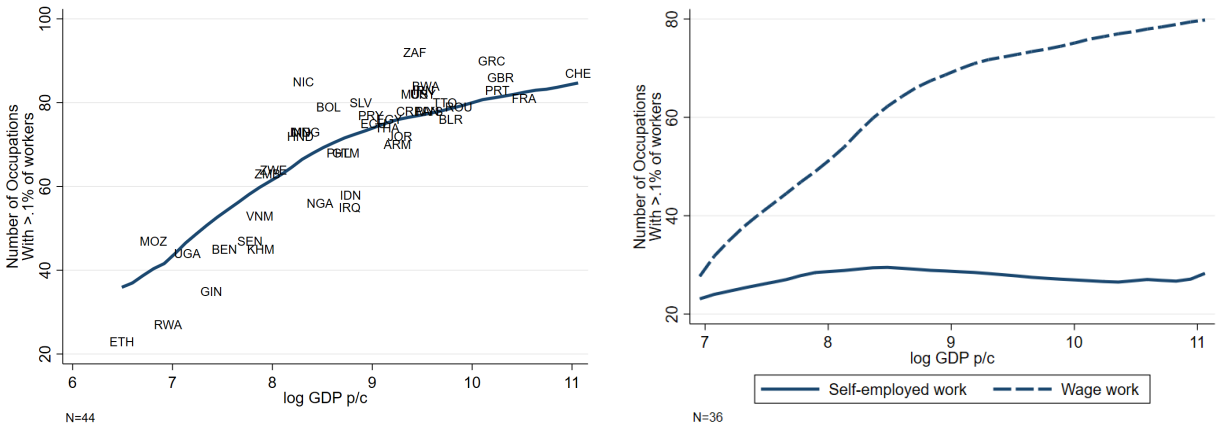


Figure 13: Occupational composition of jobs against GDP by gender



(a) Pooled

(b) by Employment Status

Figure 14: Occupational variety and economic development

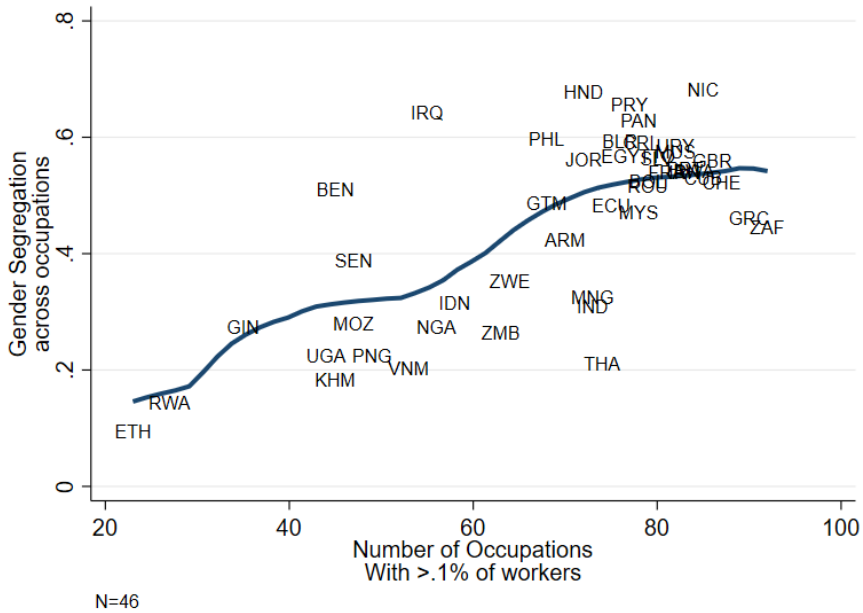


Figure 15: Occupational Segregation by Gender and Occupational Variety

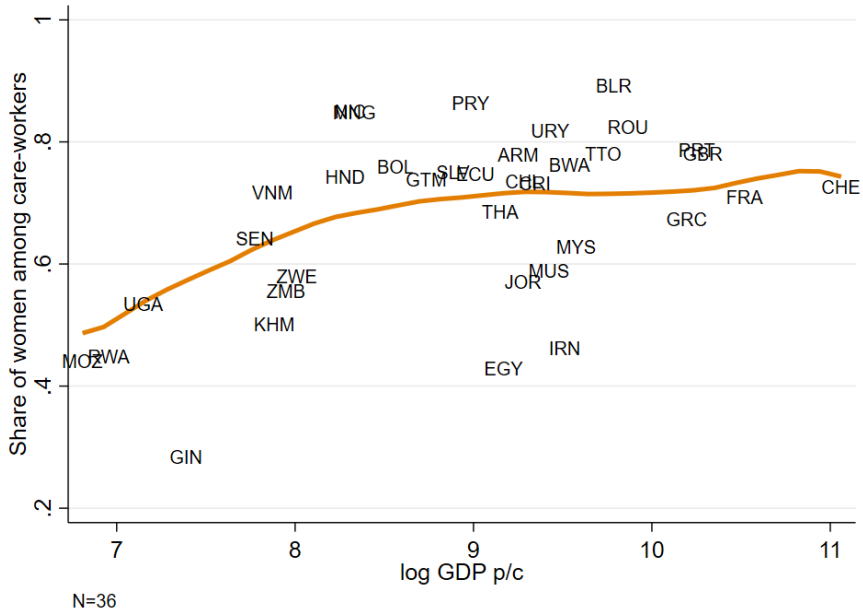


Figure 16: Share of care work done by women

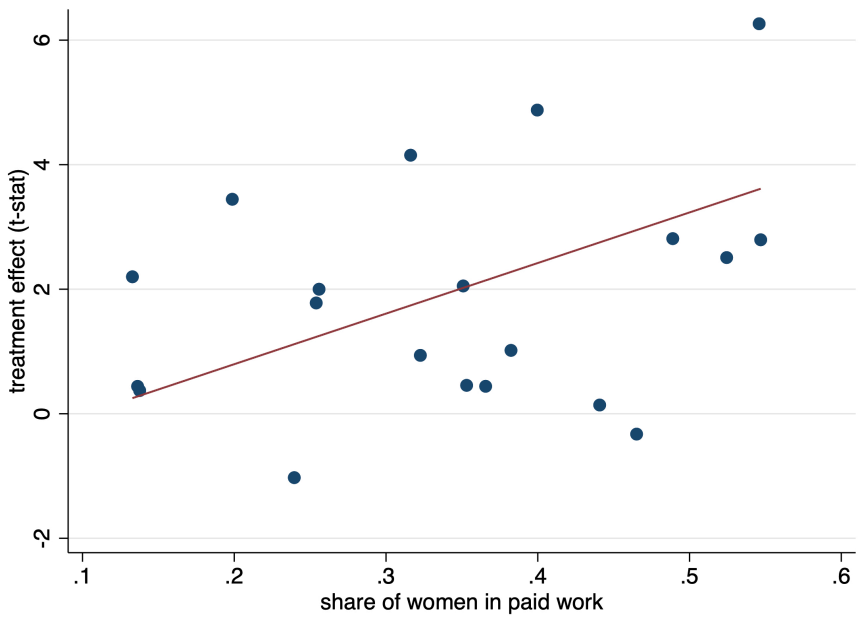
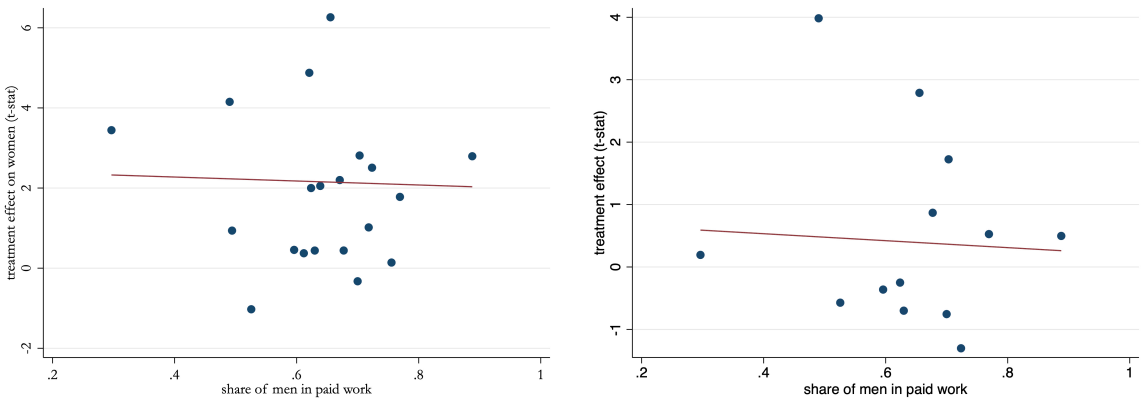


Figure 17: Effectiveness of training programs for women and share of women at work



(a) Effect for women

(b) Effect for men

Figure 18: Placebos: effectiveness of training program against share of men at work

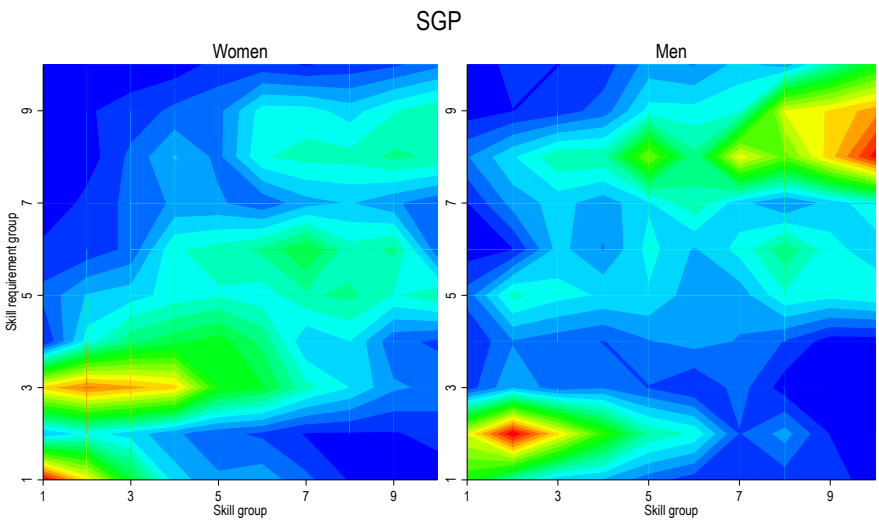


Figure 19: Match between skills and skill requirement, Singapore

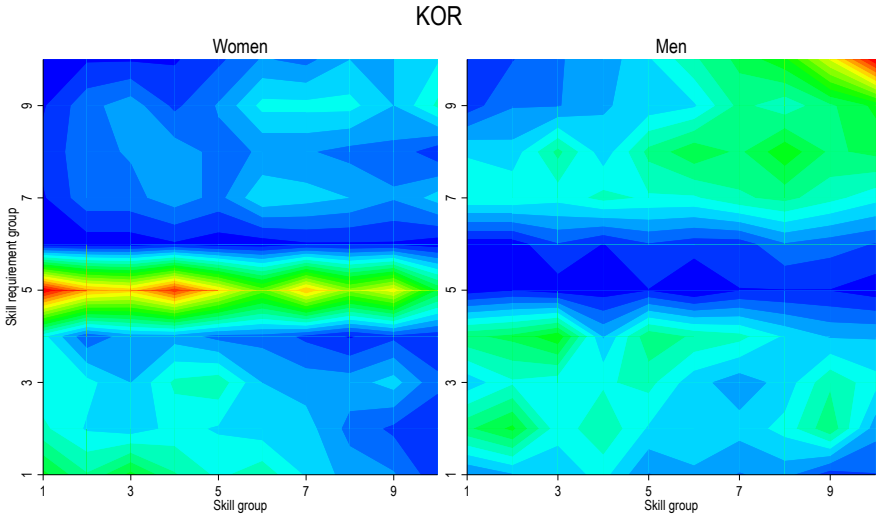


Figure 20: Match between skills and skill requirement, Korea

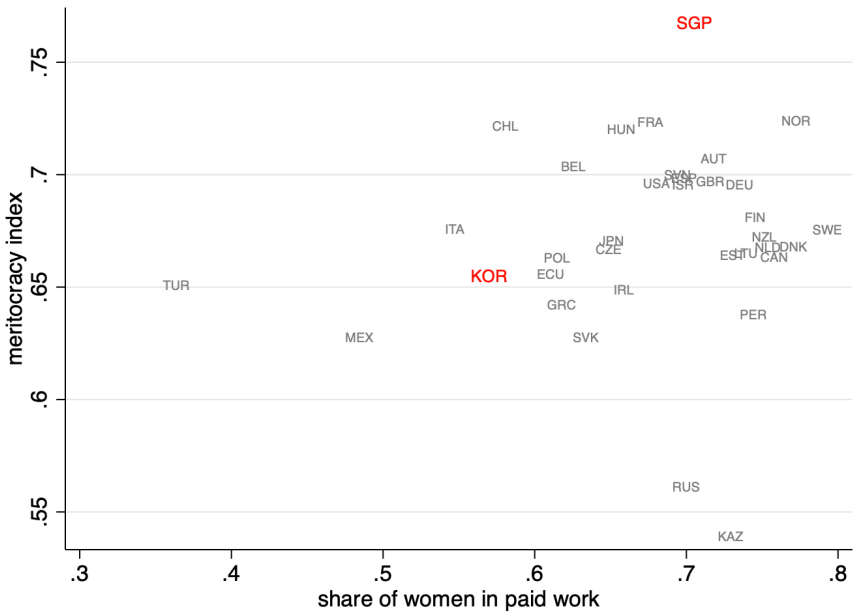


Figure 21: Worker-skill match and women in paid work

A Data Description

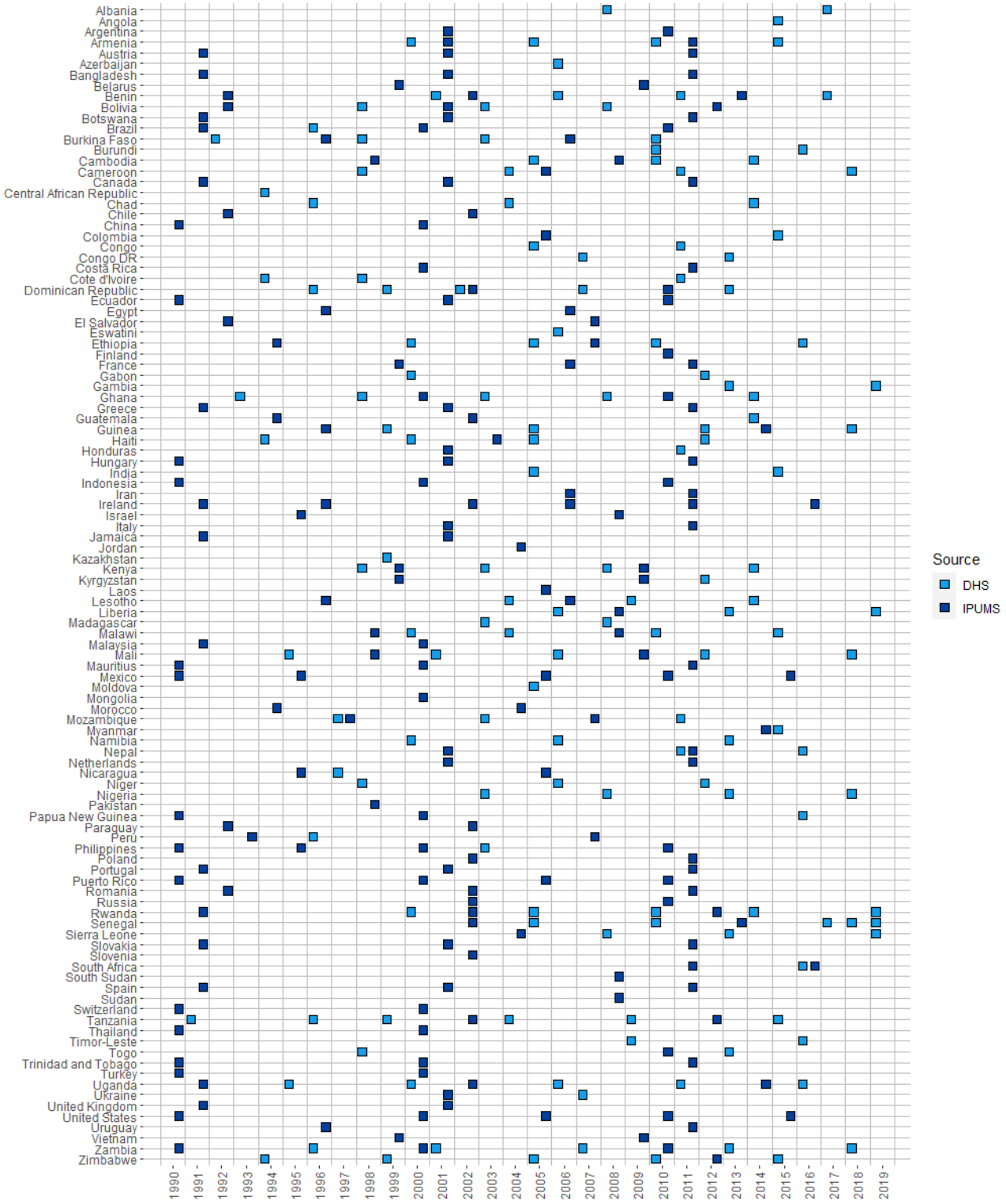


Figure A.22: Data coverage in JWD by country and year

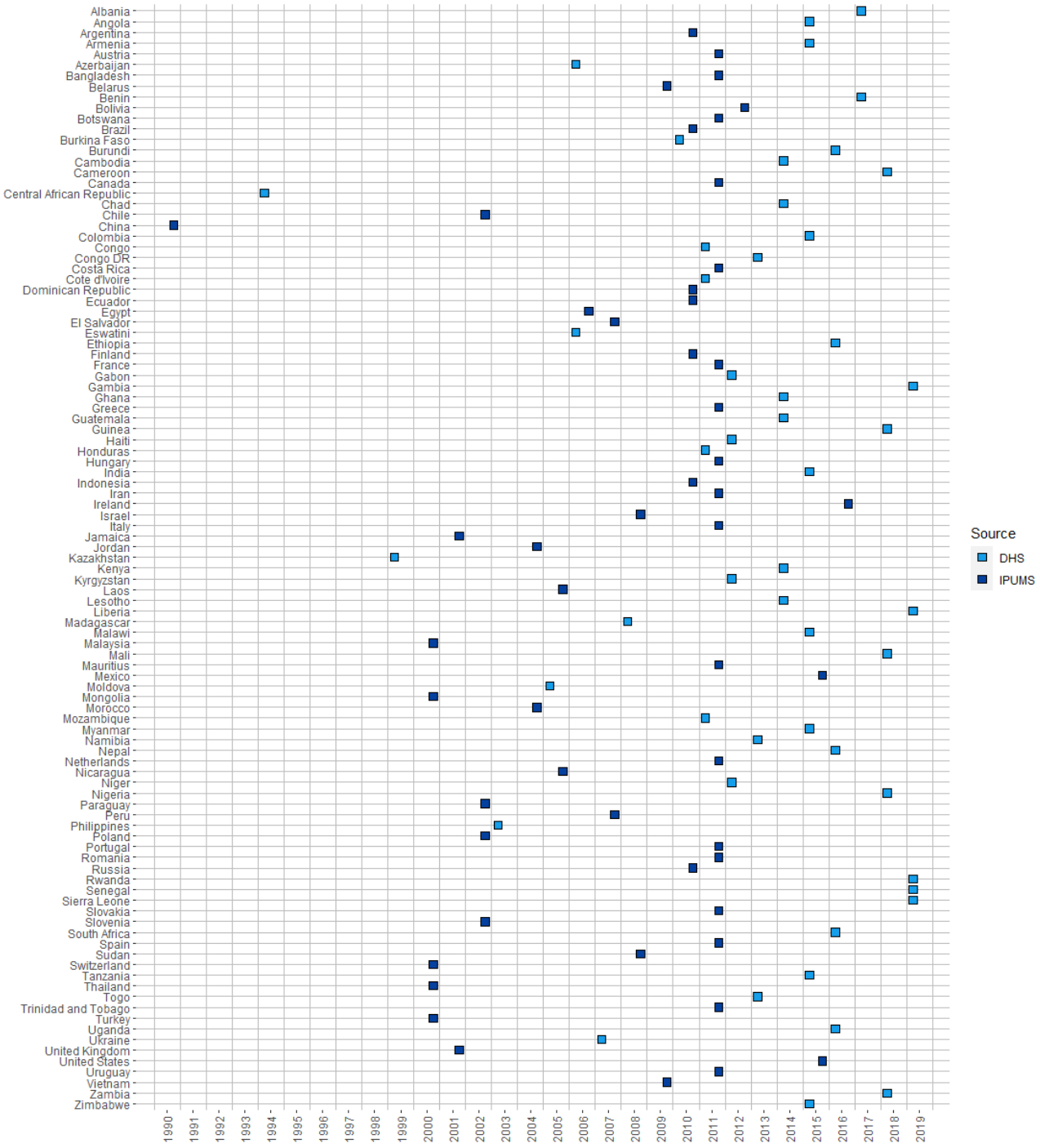


Figure A.23: Data coverage for analyses in this paper

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
AER	Erica Field, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore	2021	India	(i) Open bank account; (ii) training	2013-2017	8244	0.018	0.033	Employment, Pooled: outcomes from both the short- [1 year] and long-run [3 years] surveys; worked for pay past month
AER	Erica Field, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore	2021	India	(i) Open bank account, (ii) training, (iii) direct deposit	2013-2017	8244	0.051	0.028	Employment, Pooled: outcomes from both the short- [1 year] and long-run [3 years] surveys; worked for pay past month
Econometrica	Livia Alfonsi, Oriana Bandiera, Vittorio Bassi, Robin Burgess, Imran Rasul, Munshi Suliman, Anna Vitali	2020	Uganda	Firm training – 50$ a month to firms to train workers for 6 months (12$ retained by owner, 38$ as a salary)	2012-2017	1424	0.07	0.077	Estimates for Labor Market Index: Any paid work in the last month + months worked in last year + hours worked in last week + total earnings in last month
Econometrica	Livia Alfonsi, Oriana Bandiera, Vittorio Bassi, Robin Burgess, Imran Rasul, Munshi Suliman, Anna Vitali	2020	Uganda	Vocational training – 470$ subsidy to fully pay for a 6 h/d, 6 months, sector specific training program	2012-2017	1424	0.134	0.061	Estimates for Labor Market Index: Any paid work in the last month + months worked in last year + hours worked in last week + total earnings in last month
Restud	Girum Abebe, Stefano Caria, Marcel Fafchamps , Paolo Falco, Simon Franklin and Simon Quinn	2020	Ethiopia	Training: Orientation (signals, i.e. education, job experience) & Certification (certify hard-to-observe skills)	2014-2018	2018	0.093	0.027	Figures presented refer to the long-run impact [2018 follow-up] for the full sample // Employment = 'Formal Employment': Any job with a written contract

Table A.1: Variables in JWD

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
Economic Journal	Sarojini Hirshleifer, David McKenzie, Rita Almeida, Cristobal Ridao-Cano	2015	Turkey	Free government-funded vocational training courses	2011	5497	0.011	0.025	Estimates for females under 25 [no estimates provided for aggregate female sample] --> (i) Estimates for older women provide a similar story, (ii) We fail to reject the null of equality between men and women for all outcomes
Review of Economics and Statistics	Matthew Groh, Nandini Krishnan, David McKenzie & Tara Vishwanath	2016	Jordan	Soft-skills training	2010-2013	3759	0.005	0.039	Figures for: Assignment to treatment, 2013 follow-up
AEJ: Applied	Orazio Attanasio, Arlen Guarín, Carlos Medina, Costas Meghir	2017	Colombia	Skills Training (classroom training + on-the-job training + youths 'project for life' + $2.2 stipend/d)	2005-2014	2125	0.047	0.015	Figures refer to 'Evaluation Sample' for women [cannot reject null of equality across genders] & Sample size in regression is individuals x 12 months --> Reported n_regression/78
AEJ: Applied	Christopher Blattman, Eric P. Green, Julian Jamison, M. Christian Lehmann, Jeannie Annan	2016	Uganda	(i) Business skills training, (ii) $150 to implement business plan, (iii) Supervision by trainers	2009-2012	1734	0.401	0.03	86% of individuals in the sample are women & We cannot reject equality of treatment effects by gender
AEJ: Applied	Christopher Blattman, Eric P. Green, Julian Jamison, M. Christian Lehmann, Jeannie Annan	2016	Uganda	(i) Business skills training, (ii) $150 to implement business plan, (iii) Supervision by trainers, (iv) Group dynamics training	2009-2012	1734	0.409	0.033	86% of individuals in the sample are women & We cannot reject equality of treatment effects by gender
AEJ: Applied	Oriana Bandiera, Niklas Buehren, Robin Burgess, Markus Goldstein, Selim Gulesci, Imran Rasul, Munshi Sulaiman	2020	Uganda	(i) Skills Training = "hard" vocational skills, (ii) Information treatment = "soft" life skills	2008-2012	3474	0.49	0.2	Figures refer to 4-year endline
AEJ: Applied	Claudia Martínez, Esteban Puente, Jaime Ruiz-Tagle	2018	Chile	(i) Skill training for 3 weeks, 60 hours; (ii) Asset transfer to develop business plan (buy inputs)	2010-2014	1427	0.073	0.031	Figures refer to 2013 endline data // 93% beneficiaries are women

Table A.2: Variables in JWD (continued)

B Meta Analysis Bibliography

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
AEJ: Applied	Claudia Martínez, Esteban Puente, Jaime Ruiz-Tagle	2018	Chile	(i) Skill training for 3 weeks, 60 hours; (ii) Asset transfer 600$ to develop business plan (buy inputs); (iii) Additional 'surpise' transfer 240$	2010-2014	1427	0.056	0.032	Figures refer to 2013 endline data // 93% beneficiaries are women
AEJ: Applied	Orazio Attanasio, Adriana Kugler, and Costas Meghir	2011	Colombia	Skills Training (classroom training + on-the-job training + youths 'project for life' + $2.2 stipend/d)	2005-2006	1367	0.054	0.022	Figures for female sample & controlling for course fixed effects and pretreatment characteristics
Journal of Labor Economics	David Card, Pablo Ibarrarán, Ferdinando Regalia, David Rosas-Shady and Yuri Soares	2011	Dominican Republic	Training: (i) basic skills (work habits & self-esteem) + (ii) vocational (customized to the needs of local employers) + (iii) 1000 Pesos/month (1/4 monthly income) reimbursement	2004-2005	754	2	3.8	Figures refer to regressions with covariates for females subgroup
Journal of Development Economics	Suresh de Mel, David McKenzie and Christopher Woodruff	2013	Sri Lanka	(i) Business training: generate, start & improve your business + technical training (ii) Grant 15k Rs	2009-2011	587	1.751	1.382	Figures from treatment effect on women owning a business before treatment (pooled, ITT) --> Employment = Hours worked in levels, truncated
Journal of Development Economics	Suresh de Mel, David McKenzie and Christopher Woodruff	2013	Sri Lanka	(i) Business training: generate, start & improve your business + technical training	2009 - 2011	587	1.889	1.399	Figures from treatment effect on women owning a business before treatment (pooled, ITT) --> Employment = Hours worked in levels, truncated
Journal of Development Economics	Shubha Chakravarty, Mattias Lundberg, Plamen Nikolov, Juliane Zenker	2019	Nepal	(i) Technical training (with certification), (ii) Job-search-assistance, (iii) life-skills training	2010-2013	4004	0.08	0.04	ITT
Journal of Development Economics	Moussa Blimpo, Todd Pugatch	2021	Rwanda	Teacher training program	2016-2018	1654	-0.04	0.02	/

Table B.3: List of Papers for meta analysis

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
Journal of African Economies	Annie Alcid, Erwin Bulte, Robert Lensink, Aussi Sayinzoga and Mark Treurniet	2021	Rwanda	Training: (i) Work-Readiness Curriculum, (iii) Complementary trainings (saving groups), (iv) On-the-job training (intership, apprenticeship)	2013-2017	310	0.07	0.052	Estimates are medium-term impacts (2 years after training), ITT
Labour Economics	Pushkar Maitra, Subha Mani	2017	India	Subsidized vocational education program in stitching and tailoring for women residing in low-income households	2010-2012	878	0.081	0.03	Figures refer to 18-month endline, ITT
Labour Economics	Jumana Alaref, Stefanie Brodmann, Patrick Premand	2020	Tunisia	Entrepreneurship track in university: (i) entrepreneurship courses; (ii) follow-up support on business plan development by 'coaches'; (iii) business plan supervision from university professors	2009-2014	1452	0.01	0.02	Figures are long-term (4 year) outcomes, ITT, self-employment
Labour Economics	Paloma Acevedo, Guillermo Cruces, Paul Gertler, Sebastian Martinez	2020	Dominican Republic	(i) Soft skills training; (ii) Internship; (iii) Vocational education	2009-2013	2779	0.01	0.03	Figures refer to outcomes 3.5 years after treatment, ITT
Labour Economics	Paloma Acevedo, Guillermo Cruces, Paul Gertler, Sebastian Martinez	2020	Dominican Republic	(i) Soft skills training; (ii) Internship	2009-2013	2779	0.013	0.027	Figures refer to outcomes 3.5 years after treatment, ITT
World Development	Nina Rosas, Maria Cecilia Acevedo, Samantha Zaldivar	2021	Sierra Leone	(i) Technical skills training; (ii) Business skills training	2013-2015	1277	0.0181	0.019	Estimates refer to aggregate effect of program across the different treatment arms
World Development	Patrick Premand, Stefanie Brodmann, Rita Almeida, Rebekka Grun And Mahdi Barouni	2016	Tunisia	Entrepreneurship track in university: (i) entrepreneurship courses; (ii) follow-up support on business plan development by 'coaches'; (iii) business plan supervision from university professors	2009-2011	1580	0	0.03	68% sample are women // Specification III: set of controls + S.E. clustered by the governorate // Employment refers to last 7 days

Table B.4: List of Papers for meta analysis (continued)

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
Industrial and Labor Relations Review	Pablo Ibarrarán, Jochen Kluve, Laura Ripani, David Rosas Shady	2018	Dominican Republic	Training: (i) basic skills (work habits & self-esteem) + (ii) vocational (customized to the needs of local employers) + (iii) 1000 Pesos/month (1/4 monthly income) reimbursement	2004-2014	2041	0.0165	0.025	ITT, long-term impacts (endline 2014)
IZA Journal of Labor and Development	Pablo Ibarrarán, Laura Ripani, Bibiana Taboada, Juan Miguel Villa & Brigida Garcia	2014	Dominican Republic	Training: (i) basic skills (work habits & self-esteem) + (ii) vocational (customized to the needs of local employers) + (iii) 1000 Pesos/month (1/4 monthly income) reimbursement	2008-2011	2350	0.0069	0.024	ITT
IZA Journal of Labor & Development	Matthew Groh, Nandini Krishnan, David McKenzie & Tara Vishwanath	2016	Jordan	Soft-skills training	2010-2013	3759	0.021	0.034	Estimates from 3rd follow-up
Economic Development and cultural change	Gabriela Calderon, Jesse M. Cunha, Giacomo De Giorgi	2019	Mexico	Free training in business-literacy	2009-2012	1411	2.686	2.639	Estimates for 'hours worked by owner' and 'standardized profits' ; ITT
Working Paper – NBER	Erica Field, Leigh L. Linden, Ofer Malamud, Daniel Rubenson & Shing-Yi Wang	2019	Mongolia	Admission to formal 2-year vocational secondary school programs	2010-2015	3883	0.0764	0.018	/

Table B.5: List of Papers for meta analysis (continued)

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
Working Paper – NBER	Achyuta Adhvaryu, Namrata Kala, and Anant Nyshadham	2018	India	Training: 2-h/w, garment sector women, in Communication, Problem Solving and Decision-Making, Time and Stress Management, Execution Excellence, Financial Literacy, Legal Literacy and Social Entitlements	2013-2015	1616	0.0761	0.037	SAMPLE SIZE from Summary Statistics // We refer to 'Production Data' (the authors argue it suffers less from measurement error), Table 2, figures from 'After' treatment // EMPLOYMENT = Worker Retained & Present in Factory, DAYS = Sum of Days Working for Each Worker to Date
Working Paper – World Bank	Yoonyoung Cho, Davie Kalomba, Ahmed Mushfiq Mobarak, Victor Orozco	2013	Malawi	Vocational training	2010-2011	347	-4.405	4.294	ITT, Hours worked in paid labour in the month after training
Working Paper – World Bank	Maddalena Honorati	2015	Kenya	(i) Classroom technical training: Life skills training; Core business training, (ii) Internship	2012-2013	558	0.045	0.016	ITT
Working Paper – World Bank	Franck Adoho, Shubha Chakravarty, Dala T. Korkoyah, Jr., Mattias Lundberg, Afia Tasneem	2014	Liberia	Skill training to young women/adolescents girls to transition to employment: "Job Skills" track	2010-2012	3200	0.101	0.041	ITT, OLS with controls
Working Paper – World Bank	Franck Adoho, Shubha Chakravarty, Dala T. Korkoyah, Jr., Mattias Lundberg, Afia Tasneem	2014	Liberia	Skill training to young women/adolescents girls to transition to employment: "Business Development Services" track	2010-2012	3200	0.226	0.031	ITT, OLS with controls
Working Paper – World Bank	Niklas Buehren, Markus Goldstein, Selim Gulesci, Munshi Sulaiman, Venus Yam	2017	Tanzania	(i) Adolescent development centers; (ii) Life skills training (sexual and reproductive health); (iii) Livelihood training (IGA); (iv) Meetings with the parents and village elders	2009-2011	6358	0.018	0.019	ITT

Table B.6: List of Papers for meta analysis (continued)

Journal	Authors	Year Published	Country	intervention	Years Experiment	Sample Size	coef.	se	notes
Working Paper – World Bank	Niklas Buehren, Markus Goldstein, Selim Gulesci, Munshi Sulaiman, Venus Yam	2017	Tanzania	(i) Adolescent development centers; (ii) Life skills training (sexual and reproductive health); (iii) Livelihood training (IGA); (iv) Meetings with the parents and village elders	2009-2011	6358	-0.018	0.027	ITT
Working Paper – SSRN	Daniel Da Mata, Rodrigo Oliveira, Diana Silva	2021	Brazil	Tuition-free vocational training program for students graduating from secondary studies	2011-2017	70006	0.0469	0.019	Cohort 1 estimates, ITT, pooled effects for 3 years after the end of the program
Working Paper – IZA	Ahmed Elsayed, Rania Roushdy	2017	Egypt	(i) business skills training, (ii) vocational training, and (iii) life skills, legal rights and civic education.	2013-2014	11412	0.044	0.02	Measure is 'any Income Generating Activity', ITT
Working Paper – IDB	Juan Diaz, David Rosas	2016	Peru	(i) 3-month classroom technical training (knitting, sales support, bakery); (ii) 3-month internship (below minimum wage salary)	2009-2013	1718	0.015	0.034	ITT, 2013 follow-up

Table B.7: List of Papers for meta analysis (continued)

Grouping variables			
Variable	Definition	DHS implementation	IPUMS implementation
female	Dummy variable identifying female respondents	Data from Individual Recode files (IR) is assigned female=1, while data from Men Recode files (MR) is assigned female=0	Computed from variable *sex*
age5year	Respondents' age, in 5-years brackets	v013	Equivalent to variable *age2*
children_d	Respondents with children	v201 records the number of childre born to the respondent. We turn this variable into a dummy identifying respondents that have had at least on children	Variable *chborn* records the number of children born to each respondent (women only)
decob	Respondents decade of birth	Computed using the age variable (v013) and the year of the interview (v008)	Year of birth is recovered by comparing the survye year and respondents' age.
educlvl	Highest education level achieved	v106 records the highest educational level achieved	Equivalent to variable *edattain*
marital	Marital status	V502 records respondents' marital status. Our marital status variable matches v502 and includes 3 categories: [1] never married, [2] currently married, [3] formely married	
urban	Urban/rural place of residence	v025 provides information on whether respondets currently reside in a urban or rural area.	Equivalent to variable *urban*
wealth_hi wealth_pca_q	Respondent above/below median level of wealth Respondents' quintile in national wealth distribution	For each respondent, we constructed a wealth index with a procedure analogous to Filmer and Pritchett (2001) - details can be found in the documentation. Using weights (v005) we reconstruct the national wealth distribution for all households, and determine whether each respodent's lies aobve of below the median, as well as allocate them into quintiles	For each respondent, we constructed a wealth index with a procedure analogous to Filmer and Pritchett (2001) - details can be found in the documentation. Using weights (hhwt) we reconstruct the national wealth distribution and determine whether each respodent's liws aobve of below the median, as well as allocate them into quintiles
Labour Force Participation			
Variable	Definition	DHS implementation	IPUMS implementation
inwork	Share of population employed	v714 contains respondents' employment status	*empstat* variable records respondents' employment status
employee employee_all selfemployed selfemployed_all	Share of workers in wage employment Share of population in wage employment Share of workers selfemployed or working in a family business Share of population selfemployed or working in a family business	v719 reports the identity of respondents' employers. V741 reports how respondents are paid for their work Respondents are considered in wage employement if the work *for someone else* , and are paid at least partly in cash.	*classwk* records type of employment. Category [1] identifies self-employed; category [2] identifies wage workers. Unpaid work is not included.
Employment Type			
Variable	Definition	DHS implementation	IPUMS implementation
paidwk paidwk_all unpaidwk unpaidwk_all	Share of population paid for their work Share of workers paid for their work Share of population not paid for their work Share of workers notpaid for their work	V741 reports how respondents are paid for their work. When this variable is missing, v720 is used instead. Respondents engaged in paid employment if they are paid completely or partly in cash	classwk records type of employment. Categories [1] self-employed, [2] wage worker, [4] other, are classified as paid employment
allyearwk allyearwk_all seasonalwk seasonalwk_all	Share of workers employed throughout the year Share of the population employed throughout the year Share of the population engaging in seasonal employment Share of the population engaging in seasonal employment	v732 reports whether respondets are employed all-year around, seasonally or occasionally.	not defined not defined not defined not defined
sector_agri sector_agri_all sector_nonagri sector_nonagri_all sector_manuf sector_manuf_all sector_serv sector_serv_all	Share of workers employed in agriculture Share of population employed in agriculture Share of workers not employed in agriculture Share of population not employed in agriculture Share of workers not employed in manufacturing Share of population not employed in manufacturing Share of workers not employed in the service sector Share of population not employed in the service sector	v717 provides details on respondets' occupations. The following categories are coded as agricultural employment: [4] agric-self employed, and [5] agric-empoloyee. The remaining categories are coded as non-agricultural employment not defined not defined not defined not defined	variable *indgen* reports the industry in which respodents are active/employed. Each indicator is constructed using the following categories of the source variable: Agriculture: [10][20] Manufacturing: [30][40][50] Services: [60][70][80][90][100][110][111][112][113][114][140]
highskillwk highskillwk_all whitecollar whitecollar_all bluecollar bluecollar_all	Share of workers in high skill jobs Share of population in high skill jobs Share of workers in white collar jobs Share of population in white collar jobs Share of workers in blue collar jobs Share of population in blue collar jobs	v717 provides details on respondets' occupations. Each answer category is recoded as follows High skill: [1] prof., tech., manag.; White collar: [2] clerical [3] sales [7] services; Blue collar: [4] agric-self employed [5] agric-empoloyee [6] household & domestic [8] skilled manual [9] unskilled manual.	variable *occisco* records ISCO codes for respondents' occupations. Each indicator is constructed using the following categories of the source variable: High skill: [1][2][3] White collar: [4][5] Blue Collar: [6][7][8][9]
allyearwk allyearwk_all seasonalwk seasonalwk_all	Share of workers employed throughout the year Share of population employed throughout the year Share of workers employed seasonally Share of population employed seasonally	v732 reports whether a worker is employed [1] all year, or [2] seasonally	not defined not defined not defined not defined
public public_all private private_all	Share of workers employed in the public sector Share of population employed in the public sector Share of workers employed in the private sector Share of population employed in the private sector	not defined not defined not defined not defined	The following categories form variable *indgen* are coded as representing the public sector: [100] public administration and defense, [112] education, [113] heatlh and social work. All other categories are assumed to represent private sector employment.
self_paid self_unpaid employee_paid employee_unpaid	Share of workers selfemployed and paid Share of workers selfemployed and unpaid Share of workers working for others and paid Share of workers working for others and unpaid	Combination of previously defined variables: *selfemployed, paidwk* Combination of previously defined variables: selfemployed, paidwk Combination of previously defined variables: employee, paidwk Combination of previously defined variables: employee, paidwk	Combination of previously defined variables: *selfemployed, paidwk* Combination of previously defined variables: selfemployed, paidwk Combination of previously defined variables: employee, paidwk Combination of previously defined variables: employee, paidwk
self_agri self_nonagri self_manuf self_serv	Share of workers selfemployed in agriculture Share of workers selfemployed outside of agriculture Share of workers selfemployed in manufacturing Share of workers selfemployed in service sector	Combination of previously defined variables: *selfemployed, sector_agri* Combination of previously defined variables: *selfemployed, sector_agri* not defined not defined	Combination of previously defined variables: *selfemployed, sector_agri* Combination of previously defined variables: *selfemployed, sector_agri* Combination of previously defined variables: *selfemployed, sector_manuf* Combination of previously defined variables: *selfemployed, sector_serv*
employee_agri employee_nonagri employee_manuf employee_serv	Share of workers working for others in agriculture Share of workers working for others outside of agriculture Share of workers working for others in manufacturing Share of workers working for others in service sector	Combination of previously defined variables: *employee, sector_agri* Combination of previously defined variables: *employee, sector_agri* not defined not defined	Combination of previously defined variables: *employee, sector_agri* Combination of previously defined variables: *employee, sector_agri* Combination of previously defined variables: *employee, sector_manuf* Combination of previously defined variables: *employee, sector_serv*

Table B.8: List of Papers for meta analysis (continued)

Education			
Variable	Definition	DHS implementation	IPUMS implementation
edyrtotal	Average number of year of schooling	v133 records the number of completed years of education	Equivalent to variable *yrschool*
no_educ	Share of population with no education	v106 records the highest educational level achieved	Dummy equal to 1 if *yrschool* equals to zero
atleastprimary	Share of population with at least primary education		*edattain* reporst the highest educational level achieved
atleastsecondary	Share of population with at least secondary education		
Marriage and Fertility			
Variable	Definition	DHS implementation	IPUMS implementation
agefrstmar	Average age at first marriage	V511 reports respondents' age at marriage	not defined
ageat1stbirth	Average age at first birth	V212 reports respondents' age at first birth	not defined
Migration			
Variable	Definition	DHS implementation	IPUMS implementation
migrant	Share of population that has migrated at least once	V104 records how long each respondent has been living in the current location. Category [95] identifies respondents that have never migrated	*migyrs1* records how long respondent has been living in the current location. If this value is lower than the respondents' age - recorded in variable *age* - they are considered to have migrated
kid_ruraltourban	Share of population that migrated from a urban to a rural area	v025 provides information on whether respondets currently reside in a urban or rural area.	not defined
kid_urbantorural	Share of population that migrated from a urban to a rural area	v103 provides information on respondents' place of residence as children.	not defined
kid_ruraltorural	Share of population that migrated from a rural to a rural area	We code the following categories as urban: [0] capital, large city [1] city [2] town. We code the following category as rural: [3] countryside	not defined
kid_urbantourban	Share of population that migrated froma urban to a urban area	For respondents who migrated, we compare the characteristics of their place of residence during childhood and the current one. The resulting outcome is measured as a share of the population.	not defined
migchild	Share of population that has migrated to the current location as a child (age 0-12)	These variables are created comparing respondents' age (v012) to the number of years they have lived in the current location (v104).	Indicators constructed comparing respondents age - recorded in variable *age* - and respondents' tenure in the current location - recorded in variable *migyrs1*.
migteen	Share of population that has migrated to the current location as a teenager (age 13-19)		
migadult	Share of population that has migrated to the current location as an dult (age 20+)		
agedif_marmig	Average number of years between the last migration spell and marriage, for married respondents	V104 records how long each respondent has been living in the current location. v502 reports respondents marital status.	not defined
migatmar	Share of women who migrated within a year of their first marriage,	v511 contains age at marriage.	not defined
migatmar_all	Share of women who migrated within a year of their first marriage, among all women who married once.	These variables are used to identify repondents that are married and have migrated. For these respondents, we then compare their age at marriage with their age at the start of their last migration spell,	not defined
migpremar	Share of women who migrated on or more years prior to their first marriage, among all women who married once and migrated at least one time.		not defined
migpremar_all	Share of women who migrated on or more years prior to their first marriage, among all women who married once.		not defined
migpostmar	Share of women who migrated on or more years after to their first marriage, among all women who married once and migrated at least one time.		not defined
migpostmar_all	Share of women who migrated on or more years after to their first marriage, among all women who married once.		not defined
Other			
Variable	Definition		
year	Year of the first observation collected in each survey	v008 contain CMC date of interview, which is converted in years of the Gregorian calendar	Equivalent to variable *year*
country_dhs	Two-letter country identifier used in DHS data		
country_string	Full country name		
countrycode	ISO 3166 alpha-3 country codes (e.g. used by PWT)		
country_ipums	ISO 3166 numeric country codes (e.g. used by IPUMS)		
region	Broad geographical regions, following World Bank's classification.		
pop	Country population, from Penn World Tables v10.0.		
lgdppc	Log GDP per capita, in constant 2017 dollars, from Penn World Tables v10.0.		
source	Dataset from which the observation was created.		

***Note:** for DHS, implementation details refer to women's data (IR dataset)**.** For men data, instructions are analogous, but variable names have "m" as a prefix in the source data, e.g. interview date is contained in variable v008 for women and variable mv008 for men.
****Note:** the coding of DHS data is not always consistent across countries and time. For this reason, the instructions below on how variables were built should be considered as broadly applicable but indicative. Full details can be found in the replication code.

*****Note:** All grouping variables are used to generate subgroup averages for the outcomes included in the dataset. However, these are also used as outcomes and, once averaged within a sample or group of interest, they will give the share of the population beloging to each observation. For grouping variables taking more than one value, these are turned into dummies. For example, when looking at the dataset of cross-country aggregates where for each country we keep urban and rural samples separate (pooled_urban.dta), the variable children_d will indicate -- for each country, year and urban/rural status -- the share of the sample population that has at least one children. For marital status, instead, the dataset will include three variables -- marital_1 marital_2 marital_3 -- indicating the sample in each observation that is never married, currently married, and formerly married.

Table B.9: List of Papers for meta analysis (continued)