Job Quality of Wage Employment across Developing Countries[1]

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Abstract

Measuring the quality of employment across countries has been challenging, so much work relies on a single indicator, such as formality or wages. This paper contributes to the policy discussion by proposing a global measure of job quality for wage employment. We assemble a harmonized dataset of labor force and household surveys, across 40 developing countries, and create a measure of job quality across four dimensions: sufficient income, access to employment benefits, job stability, and adequate working conditions. Results show significant variation of job quality across countries, economic sectors, and sociodemographic characteristics including age, location, and level of education. Countries in the Latin America and the Caribbean region have relatively higher levels of job quality, while countries in Sub-Saharan Africa display the lowest levels of job quality. Most workers in the finance and business services, public administration, and utilities sectors have, on average, better jobs. Higher education matters for securing greater job quality in the form of higher earnings, benefits, and job stability. Finally, the average job quality of wage employment is relatively similar between men and women in all dimensions but income.

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1. Introduction

Quality employment is associated with greater productivity and better living standards, and a critical way to achieve sustainable growth and poverty reduction. The problem for most poor people in developing countries is not primarily the lack of a job but that the jobs they have do not provide a steady paycheck and benefits that are enough to secure a better future for themselves and their families or need to work long hours that affect their well-being (World Bank, 2012). There have been few studies to examine job characteristics across countries beyond a single indicator (e.g., wages or formality), and given the difficulties with harmonizing microdata across countries, these studies have focused on a single region or country. A large majority of the existing studies that use microdata focus on country-specific issues l, such as in Turkey (Del Carpio, Gruen, & Levin, 2017) and Poland (Lewandowski, Gora, & Lis, 2017), or region-specific multi-country analyses, such as Brummund et al (2018) and Sehnbruch et al (2020) in Latin America, Leschke et al (2014) in Europe, and Bocquier et al (2010) in urban West Africa.

This paper develops a measure of job quality that can track labor market outcomes across developing countries. With increased availability, and improved quality, of labor force and household surveys in many developing countries, progress has been made in uncovering drivers of the economic well-being of individuals from poor and vulnerable populations (Banerjee & Duflo, 2007). This paper adds to this growing body of literature by proposing a measure of job quality using microdata. Measuring job quality with microdata offers the opportunity for disaggregation across sociodemographic groups, industries and locations. This flexibility is important for uncovering characteristics of employment that are correlated with poverty, especially among disadvantaged groups, such as women and low skilled workers. Moreover, integrating labor force and household survey data at the local level, such as access to markets and infrastructure, can guide future research on the determinants of good jobs.

Our analysis follows well-established international conventions when selecting job quality characteristics. The United Nations' Sustainable Development Goal 8 aims to "foster sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all". Indicators to assess 'decent work for all' include disaggregated measures (including by sex, age, occupation, and persons with disabilities) on informal employment, hourly earnings, unemployment rate, the proportion of youth not in education and of children engaged in child labor, frequency of occupational injuries, and compliance of labor rights.[1] Similarly, the International Labour Organization (ILO) sums up 'Decent work for all' as productive work that delivers a fair income, with workplace security and social protection, prospects for development and social integration, freedom to organize, and equality of opportunity.[2] Overall, most frameworks that measure job quality agree that a good job requires earning sufficient income to improve living standards, adequate benefits, security and safety, and satisfaction, in a context of gender equality. Beyond these characteristics of the job that contribute to the well-being of the worker, jobs can also affect others' wellbeing by positive spillovers, such as female employment that often results in improvement in children's wellbeing or jobs in firms with know-how that raises productivity in other firms (World Bank,

[1] Specifically, the indicators to measure progress towards SDG 8 related to "Decent work for all" are: the proportion of informal employment in non-agriculture employment, by sex; average hourly earnings of female and male employees by occupation, age and persons with disabilities; the unemployment rate by sex, age and persons with disabilities; the proportion of youth (aged 15-24 years) not in education, employment or training; the proportion and number of children aged 5-17 years engaged in child labor, by sex and age; the frequency of fatal and non-fatal occupational injuries; and the national compliance of labor rights (freedom of association and collective bargaining) based on ILO textual sources and national legislation, by sex and migrant status. https://sdg-tracker.org/economic-growth

[2] https://ilostat.ilo.org/measuring-job-quality-difficult-but-necessary/

2012). While jobs with positive spillovers have the highest value for society, our focus is on individual job quality.

Our job quality measure is practical without compromising on its intended purpose. Selection of survey indicators considered the availability and comparability across developing countries. The proposed approach includes four dimensions of job quality: sufficient income to overcome poverty, access to job benefits, stability of employment, and adequate working conditions. These dimensions are broadly consistent with previous multi-country approaches (Brummund et al., 2018, and Sehnbruch et al., 2020). Using these four dimensions, the paper adopts the Alkire-Foster (AF) method—originally conceived to measure multidimensional poverty—for aggregating the characteristics of good jobs into one measure. Limited data availability for the self-employed and casual workers in most developing countries (mostly in agriculture) prompted us to focus on wage employment. Using these parameters, the proposed job quality measure includes a common set of indicators across 40 developing countries, in six geographic regions.[3] A robust effort of collection and ex-post harmonization of household and labor force surveys was necessary to support our analysis and aggregation.

This paper contributes to policy debates and the literature in three main ways. First, the analysis covers 40 countries across all regions of the world, providing a valuable benchmark for international comparisons. The broad geographic scope allows measuring and monitoring the impacts of economic growth and private sector investment in labor markets—beyond job creation—around the globe. Second, the job quality measure can be disaggregated by economic sector, demographic and socioeconomic characteristics, (including gender, age, education level) and subregions. This will identify vulnerable populations and lagging sectors and regions to better inform policy and private sector investments. Finally, our data harmonization effort serves as a final contribution as it constitutes a global public good and a platform to conduct further analysis on the determinants and effects of job quality . We have identified significant gaps in survey instruments across countries which are indicative of critical differences in labor markets across countries . Future updates to this baseline data can shed light on the dynamics of the quality of wage employment across the developing world.

A standardized job quality measure has several advantages over the binary formal/informality classification of workers. First, job quality measures attributes of the main job as well as the wellbeing of the worker and is not defined by the nature of the employer[4]. Second, by including multiple dimensions along job quality is defined, JQ is able to provide a more granular analysis of work and is able to capture not only the extensive margin of quality of employment as informality does, but also the intensive margin of whether job quality is improving or declining for individual workers even within the broad category of informal workers. Third, compared to broad, common informality definitions, measuring Job Quality focused on worker well-being enables policy makers to identify the most vulnerable households considering several dimensions. Using the SEDLAC data, we show that our job quality measure using four dimensions captures four distinct components and cannot easily be reduced to fewer dimensions, therefore providing richer information than common informality definitions. Our goal is to provide a comparable measure of job quality, particularly which industries and subgroups are associated with higher or lower quality jobs for wage employees. We find that quality of wage employment shows strong

[3] These regions are used by the World Bank for administrative purposes. The countries are geographically located as follows: 12 in Sub-Saharan Africa, six in East Asia and the Pacific, 12 in Latin America and the Caribbean, two in Europe and Central Asia, six in South Asia, and two in the Middle East and North Africa.

[4] A common informality benchmark is the number of employees the business of the worker employs.

heterogeneity between economic sectors. In the public administration, finance and business services, and utilities sectors, most workers have stable jobs and earn a wage above the poverty line, and about two-thirds enjoy job-related benefits and satisfaction. The quality of wage employment also varies by education, gender, age, and location. Older workers (25 years and older) have higher job quality than workers between 16-24 years of age. An education premium (tertiary education vs primary education)is found in most sectors, suggesting that higher education secures greater job quality in the form of higher benefits and stability. Perhaps surprisingly women and men show similar levels of job quality at the country level. The typical underrepresentation of female workers into wage-employment compared to men in developing countries does not seem to be the main driver behind this result but the compensating scores in two dimensions of job quality by gender. Women fare especially well in the working conditions dimension, while men perform better in terms of the income dimension. Finally, results show that wage employees in urban areas have higher job quality which is driven by higher achievements in all four dimensions.

This study, that necessarily needs to focus on wage-employees due to data availability, is a first step of a broader research agenda towards a comprehensive job quality measure in the future. Observing and comparing our Job Quality Measure (JQM) across developing countries shows a positive correlation between a countries' income level and their share of wage employees in total employment, as expected. Therefore, the differences in job quality across countries as measured by our JQM are likely to be muted given that self-employment typically involves more precarious jobs than wage-employment. Moreover, by focusing on wage-employment a sizeable part of the labor market is excluded which limits the applicability of the measure for policy purposes. Yet, the JQM covers a significant share of the labor market and evaluation the JQM by economic sector or by other disaggregation is still informative for policy aimed at influencing high quality job creation in specific areas. As it is, our measure provides a quasi-upper bound of job quality. Policies to influence the overall performance of the labor market as a whole would require a more comprehensive approach that could be implemented as better data becomes available.

The paper is organized as follows. Section 2 reviews the literature on job quality measurement and examines previous applications based on microdata at the country and regional level. Section 3 describes the conceptual framework and methodology adopted to measure job quality in the analysis. Section 4 introduces the data sources used to carry out the empirical estimation and discusses the assumptions. Section 5 presents the main results and heterogeneous analysis. Section 6 concludes.

2. Literature Review

The notion of "job quality" has become increasingly prominent in the international policy debate. The concept of "Decent Work" was introduced and declared an institutional priority in 1999 by the International Labour Organization (ILO) (Burchell et al, 2013). The United Nations promoted "…sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" as one of their Sustainable Development Goals (SDGs) in their 2030 Agenda for Development. This was adopted by all United Nations Member States in 2015. That same year the Organization for Economic Co-operation and Development (OECD) released its framework for measuring job quality. The notion of "job quality" is also part of broader OECD agendas related to people's well-being and inclusive growth (Cazes, Hijzen, & Saint-Martin, 2016).

Many academic studies have started examined job quality and its aspects (Dahl et al. 2009; Green 2005; ILO, 2008; Muñoz de Bustillo et al, 2012). It has long been recognized that there are other dimensions of a job other than income (Smith, 1776). Moreover, evidence shows that differences in these other dimensions are not always compensated by income differentials (Brown, 1980; Sullivan and To, 2014). Job formality is an indicator widely used to proxy for job quality in developing countries. However, this measure has important limitations. For example, definitions of formality vary substantially across countries making it difficult for comparisons. Formality also does not necessarily correlate with job satisfaction and the formal sector wage premium may disappear after controlling semi-parametrically for individual and employer characteristics (Pagés and Madrigal, 2008; Pratap and Quintin, 2006)[5]. Therefore, expanding the job quality measure beyond single indicators is critical for understanding the job quality as a multi-dimensional phenomenon, improving welfare, and reducing poverty.

The existing literature on job quality measurement can be partitioned into two groups: 1. studies that aggregate indicators at the macro-level; and 2. approaches exclusively based on micro-data. Within the first type of literature, the ILO proposed 18 main indicators in the areas of employment opportunities, social security, workers' representation, adequate earnings, equal opportunity and treatment in employment and work that should be abolished, decent hours, and a safe work environment. This included country-level indicators such as unemployment rate and micro-level indicators based on information from labor surveys (ILO, 2008). The ILO put forward profiles for several countries reporting these indicators[6]. The OECD also put forward a valuable proposal based on micro-data with some indicators presented at the aggregate level such as average earnings (Cazes, Hijzen, & Saint-Martin, 2016). More recently, the Inter-American Development Bank (IDB) developed a methodology to measure job quality in the Latin American and the Caribbean countries that relied solely on macro-level indicators (Busso et al., 2017). Finally, Leschke & Watt (2014) proposed a job quality measure for 27 countries in the European Union using a combination of indicators defined at the individual level and aggregate measures on wages, collective bargaining coverage, and trade union density. One of the challenges with these measures is their inability to uncover heterogeneity in job quality across sectors and groups, and therefore, cannot help to identify vulnerable sub-populations, or study determinants of job quality in developing countries[7].

Researchers have addressed these challenges by constructing measures of job quality based exclusively on micro-level data from labor force and household surveys. Many of these studies focus on a single country or on a selected group of countries. Studies for developed countries include the United States (Horowitz, 2016); Canada (Chen and Mehdi, 2019); Australia (Ribar and Wooden, 2020); and Spain (Díaz-Chao et al., 2016). Olsen et al. (2010) explore perceived job quality in four dimensions for the United States, the Great Britain, Norway, and West Germany. The literature on developing countries includes Turkey (Del Carpio, Gruen, & Levin, 2017), Poland (Lewandowski, Gora, & Lis, 2017); and several papers

[5] Pagés and Madrigal (2008) find suggestive evidence that formal status correlates poorly with job satisfaction particularly for low-skilled workers. These workers may have a low valuation of social benefits since these benefits can be low-quality, especially for poor individuals (Levy, 2008). Poor workers may also value less old age pension given their shorter life expectancy and a greater reliance on family to support them.

[6] ILO. (n.d.). *Measuring decent work*. Retrieved April 2nd, 2022, from: https://www.ilo.org/integration/themes/mdw/lang--en/index.htm

[7] Multidimensional poverty indexes often include good quality employment as one of the dimensions considered (Dirksen, 2020). Employment is not part of the World Bank's multidimensional poverty measure because in the surveys considered for that aim the relevant indicators of employment are not sufficiently harmonized (World Bank, 2018).

for the Latin American countries, including Brazil (Huneeus et al., 2015), Chile (Huneeus et al., 2012; Sehnbruch, 2006), Colombia (Gómez-Salcedo et al., 2016); Ecuador (Villacís and Reis, 2016), and Mexico (Ortega, 2013). At the same time, the job quality studies for poor countries are scarce, with the only exception being Benin (Kponou and Kamga (2018)).

. Given the paucity of indicators and difficulty in harmonizing micro-level data across countries, the existing cross-country literature is meager. Instead, the existing studies predominantly focus on developed countries with more granular data, or on a single region with comparable surveys. There have been several attempts to benchmark job quality across European countries, commonly using the European Working Conditions Survey (EWCS) (Eurofound, 2012; Muñoz de Bustillo et al., 2012; Smith et al., 2008; Simoes et al., 2012). The main advantage of the EWCS is that it provides comparable micro-level data for European countries that encompass a wide range of information on job quality. In addition to more common job characteristics such as earnings and job security, the EWCS also includes information on less common features, such as career progression, level of autonomy, and pace of work (Eurofound, 2012). Nonetheless, a major disadvantage of this dataset is its limited sample size and inability to explore heterogeneity in job quality across sociodemographic characteristics such as age, education level, sector, or region (Leschke & Watt, 2014). To circumvent this issue, Erhel et al. (2012) uses European Union Statistics on Income and Living Conditions (EU-SILC) dataset to explore within-country inequalities in three dimensions (non-standard employment, working time and skills, and career development) for 24 European countries. Brisbois (2003) use the EWCS dataset together with the EKOS Rethinking North American Integration Survey (ERNAIS) that replicated six questions from the 2000 EWCS for Canada and the United States to compare these two countries to 15 European countries in five dimensions of job quality.

There have been notable efforts to measure multi-dimensional job quality at the regional level in developing countries, especially in Latin America, where relatively high-quality survey data are available (Brummund et al., 2018, Gonzalez et al, 2021, Sehnbruch, 2020). Brummund et al. (2018) uses harmonized data for 15 Latin American countries and focuses on four dimensions that can be consistently identified in the literature: income, stability, benefits, and job satisfaction. Another dimension that is also frequently found in the literature is human capital accumulation which is excluded from their analysis due to data limitations. Sehnbruch et al. (2020) includes 9 Latin American countries and applies the three dimensions proposed by the OECD (Cazes et al., 2016) : income, stability and employment conditions, whereas González et al. (2021) focuses on six Central American countries and follows a similar approach by Sehnbruch et al. (2020) but includes job security as a fourth dimension. All three studies include similar indicators (contract work, and tenure) in their stability or security dimension[8]. Benefits indicators (social security receipts, health insurance, or retirement benefits) are included as indicators in the benefits dimension in Brummund et al. (2018), in the security dimension in González et al. (2021), and in the employment conditions dimension in Sehnbruch et al. (2020). Bocquier et al. (2010) is the only other study that looks at developing countries(West Africa region), but due to data limitations, it only includes capital cities from seven countries.

Limited attempts to measure multi-dimensional job quality in developing countries reflects the lack of comprehensive, quality data in these countries. This paper contributes to the literature by developing a

[8] In González et al. (2021) having a contract applies only to wage-employees, while for self-employed the indicator is measured as not having higher education.

multi-dimensional job quality measure that is global in scope and applicable to developing countries across all regions. Similar to Brummund et al. (2018), it proposes four dimensions of job quality that includes income, stability, benefits, and working conditions. Given the data limitations especially in poor countries, our measure allows a greater flexibility in the choice of indicators, which is discussed in the methodology section. It also focuses only on wage-employment, as information for self-employed is limited in many countries.

3. Job Quality Measure Methodology

a. Dimensions of Job Quality

Over the past decade there has been a proliferation of job quality frameworks proposed by international panels of experts both on the macro and micro level. Prominent efforts include "Decent Work Indicators" (ILO, 2013), "Job Quality Index" (Eurofund, 2012), "Indicators for Job Quality" (EMCO 2013), "Good Jobs for Development" (World Bank, 2012), "Quality of Employment" (UNECE, 2015), and the OECD's "Job Quality Framework" (Cazes et al., 2016). The main dimensions which overlap across these frameworks are: (i) earnings, (ii) benefits (social protection), (iii) job security, (iv) working conditions (physical and mental well-being). Table 1 shows common types of indicators both on micro or macro level used in the literature to measure these dimensions.

The earnings dimension measures whether a job pays sufficiently to lift a family out of poverty and into the lower middle-class. Labor earnings is the main source of material well-being for most individuals, especially in developing countries. This dimension does not only capture whether a job generates income, but also whether labor income can support a minimum standard of living for workers and their families (World Bank, 2012). As a measure of minimum living standards, this paper adopts the World Bank international poverty line of US$1.90/day per person at 2011 PPP. Focusing on individual workers' wellbeing alone, however, is not sufficient for understanding the welfare implications of employment for the population at large. A poverty headcount around the world is measured based on household and not individual income and, hence, it is imperative to consider the needs of the worker as well as his or her dependents especially in developing countries where labor earnings are the main source of family income. For the harmonization exercise, the dependency ratio is standardized across all countries and set to equal to an average household size of four with 1.5 full-time workers following the extensive methodological review of Anker (2011) [9]. This gives a wage threshold of US$ 4.94 (2011 PP) (US$1.90 (2011 PPP) multiplied by the ratio 4/1.5). To be above this threshold means that the labor earnings of an individual is enough to lift the family out of poverty, assuming other working household members will contribute at least the same as that individual.

Previous studies that measure job quality using microdata have proposed other income cutoff points. For example, Brummund et al. (2018) use as a threshold whether the job pays above the Latin America regional poverty line of US$2.50/day (2005 PPP), while Ortega-Diaz (2013) use the minimum wage for

[9] A household size greater than four may be preferable, especially for lower income countries where fertility rates are higher. However, Anker (2011) mentions a few considerations. First, data on household size is often not available in labor force surveys which usually exclude individuals outside the age of 15-64. Second, using region or country-specific estimate of completed family size can be complicated. For instance, observed average household size is affected by the distribution of household types and sizes. Single-person households would significantly reduce average household size even though this is unrelated to typical household size of workers with children.

Table 1. Common Dimensions and Indicators of Job Quality

Dimension	Areas	Indicators:
Earnings	Wage Income	• Wage income above a threshold (*)
Job Benefits	Social Protection	• Job registered with social security administration (*) • Job provides health insurance (*) • Job provides pension (*) • Job provides eligibility for unemployment insurance (*)
	Employment Benefits	• Paid annual leave (*) • Paid sick leave (*) • Paid parental leave (*)
Job Stability	Formal Employment	• Employment is bound by written contract (*) • Employment is permanent, not temporary (*) • Employer is formal entity (*)
	Tenure	• Employed in current job more than a certain number of years (*)
Working Conditions	Work-Life Balance	• Excessive working hours (*) • Work intensity • Unsocial Hours / Shift Work • Involuntary part time • Would like to work more (*) • Has a second paid job (*)
	Physical Health and Safety	• Dangerous work environments (noise, vibrations, drastic temperatures, etc) • Manual labor (moving heavy loads, painful or tiring positions) • Accidents a work
	Job Satisfaction	• Skills Match • Work autonomy • On-the-job learning and training • Good relationships with colleagues

Notes: (*) These indicators are available in our household/labor force surveys across regions of the world and are used in our job quality measure.

Mexico, and neither considers any adjustment by dependents. Sehnbruch et al. (2020) choose a level of income that reflects minimum living standards defined by a vulnerability line of US$10/day (2005 PPP) for a set of Latin American countries. They consider one dependent for each country. Moreover, it has also been argued that a definition of a good job depends on a country's level of development and that the income received enables at least a middle-class lifestyle by the country's standards (Rodrik, 2019). Based on all these other options considered in the literature, we conduct sensitivity analysis with alternative income thresholds, dependency ratios and other specification changes. The analysis shows that our job quality measure is robust to these alternative specifications (see sensitivity analysis discussion in section 4).

Many surveys do not explicitly distinguish between income components but instead report total labor income, including in-kind payments. Given this, and the fact that in-kind food payments are the most common form of in-kind payment, the income dimension includes not just wages, but also in-kind food

payments in the calculation of daily income if reported separately in a survey. To evaluate whether a job pays above the threshold, the income in local currency is adjusted to 2011 prices using the country-specific CPI values and then 2011 consumption-based PPP rate is applied (World Bank, 2015).[10] *A job that pays above the threshold is counted as a success in the income dimension.*

Admittedly, converting labor income into a binary indicator leaves out valuable information regarding the quality of a job. However, the Alkire-Foster aggregation method applied in this paper, which offers many desirable properties to construct a job quality measure (see sub-section 3.b), requires use of binary indicators. Collapsing labor income into a binary indicator is widely used in the construction of job quality measures (Brummund et al., 2018, Gonzalez et al, 2021, Sehnbruch, 2020). The literature also includes alternative composite indices which are based on continuous indicators such as the Human Development Index by the United Nations Development Programme[11] constructed as a geometric mean of three normalized continuous variables. A potential area for future research would be to construct a job quality measure that exploits the continuous nature of labor income.

Job benefits are non-wage forms of compensation which can include wages or salaries in-kind, or other desirable job aspects. In the modern labor market, employers attract workers by providing non-wage compensation in addition to normal wages or salaries. At the same time, job benefits can provide insurance against temporary income loss such as unemployment or unexpected cost such as healthcare expenditure. Insurance is a crucial instrument in preventing transient poverty due to temporary consumption variability (Jalan et al., 1998, Duclos et al., 2010). The benefits dimension includes six indicators – four related to social security; and two to work-life balance. Indicators of social security include whether the job is registered with the social security administration, having employer provided health care, pension eligibility, and unemployment insurance[12]. Indicators of work-life balance represent desirable attributes associated with employment and include paid annual leave and paid sick leave. *If a job satisfies any one of the six indicators, success is achieved in the benefits dimension*.

The stability dimension attempts to capture the sustainability of a job and its resilience to changes in seasons and economic fluctuations. The frequency and duration of job loss, or unemployment, can vary across jobs. Jobs that are seasonal, or lack resilience to economic fluctuations, are more likely to induce bouts of poverty in the future. Whereas job benefits to some degree depend on national social protection policy, job stability captures the reliability of earning an income from work of (Amuedo-Dorantes, 2010). Indicators of stability include written contract; having a permanent employment; observed job tenure in the same job; and working for a formal employer. The first two indicators capture whether there is some sort of agreement between the employer and the worker that the worker will continue working in his/her current job. We use observed job tenure as another suitable indicator of stability because if the worker has been in the same job for several years, it is likely that he/she will be able to continue there for some more years. Working for a formal employer is used as a proxy for job stability given that informal firms,

[10] CPI and PPP values are taken from the World Development Indicators database (WDI). CPI: WDI FP.CPI.TOTL; PPP: PA.NUS.PRVT.PP

[11] https://hdr.undp.org/en/content/human-development-index-hdi.

[12] Some countries provide some level of universal health care for their citizens and therefore it is less relevant whether the employer provides health insurance. However, the coverage and quality of universal health care may vary widely across countries, and, to the best of our knowledge, there is no consistent and systematic information about this across countries. For this reason, we do not include this information in the analysis but could be an area of future research if suitable information becomes available.

generally more credit constrained, are typically more vulnerable to adverse shocks (Ohnsorge and Yu, 2021; Straub, 2005)[13]. We define formal employers as those that either keep written accounts, are registered with authorities, or belong to the public sector. Unlike other definitions of formality, our definition does not include whether the job provides benefits such as annual or sick leave, so there is no overlap with the benefits dimension. *A job that fulfills at least one of these four indicators succeeds in the stability dimension.*

The working conditions dimension captures whether a job promotes physical and mental well-being of the worker. This encompasses a broad set of factors of the working environment, including working-time arrangements, health and safety, and the content of work and work opportunities. For each of these factors, there is a variety of indicators that can be used. Regarding working-time arrangements, jobs with high demands in terms of excessive working hours, high work intensity, unsocial working hours, and having more than one job can represent a significant psychological and physical burden on the worker. On the other hand, not having enough working hours would also lead to dissatisfaction. Health and safety issues at work, such as working with dangerous equipment without adequate protection or performing hard work (e.g. moving heavy loads), are directly related to the worker's physical well-being. With respect to the content of work and work opportunities, having work autonomy and learning opportunities, such as on-the-job training, are crucial for the job providing a sense of self-worth and being conducive to personal accomplishment. Jobs that lack a sense of responsibility or self-worth can be a psychological burden, and mental health is closely linked to job quality (Cottini & Lucifora, 2013).

Due to data limitations, we include only a subset of the desired characteristics of working conditions. We include the following three indicators: working excessive hours; holding a second paid job; and having a desire to work more. Hours of work is readily available across surveys, and excessive work hours are defined by the ILO as working more than 48 hours in a week. This variable can be considered as a good proxy for mental health and work-life balance. The justification for using the second paid job indicator is that workers with one job are overall more satisfied than those with multiple jobs due to physical and mental health (Smith, 2007). . Finally, if respondents would like to work more this is indicative of a poor employment situation and dissatisfaction with current job. Indicators regarding health and safety issues at work and content of work and work opportunities are typically not available in labor force or household surveys and are therefore cannot be included[14]. Unlike the three previous dimensions where only one indicator needed to be satisfied to achieve success, *the working conditions dimension requires all indicators to be satisfied to achieve success.* This union approach means a job is considered satisfactory

[13] We acknowledge that among the four indicators we use to capture stability, only having permanent employment guarantees long term stability. Having a written contract may not imply long term stability if the contract's length is limited to a certain time, having tenure also does not guarantee future permanence in the job, and having a formal employer does not necessarily imply stability as some public sector employers make use of very short-term contracts. However, given data limitations, we need to rely on these imperfect proxies of stability.

[14] These indicators are likely to be correlated, though, with other indicators included in our measure of job quality. For example, health and safety issues may be correlated with working excessive hours. Also, informal learning can be proxied ex-post by years of experience in a given job, included as tenure in the job stability dimension, and a potential proxy for formal learning is whether the employer is a formal firm, also included in the job stability category. Informal firms employ a predominantly low-skilled workforce, have lower access to financing and capital, markets and services and are thus less likely to invest into the human capital of their workers (Ohnsorge & Yu, 2021). Moreover, learning opportunities at work is not only fulfilling in its own right but also offers a path to better paying jobs and more job opportunities which increases job security (Lagakos, Moll, Porzio, Qian, & Schoellman, 2018) (Cazes, Hijzen, & Saint-Martin, 2016).

to the individual if the individual does not work excessive hours, does not work a second paid job, and would not like to work more[15].

Collective interest representation is sometimes considered a key determinant of basic rights at work, an important source of subjective job satisfaction and has been included in some job quality measures (ILO, 2008; Leschke and Watt, 2014). Another view is that labor organizing and bargaining rights are important but are not job quality outcomes per se and others argue that instead of including these indicators in the job quality measures it is useful to analyze the relationship between good jobs and unionization (Brummund et al., 2018; Sehnbruch et al, 2020). For Latin American countries, Brummund et al. (2018) find that union membership is associated with high levels of job quality but that a small percentage of workers (7 percent) in general are unionized. Data limitations prevent us from conducting a similar analysis.

b. Alkire-Foster method

Our selected method for measurement and aggregation across dimensions adapts the Alkire-Foster (AF) theoretical framework (Alkire & Foster, 2011). The AF method was originally developed as an approach for measuring multi-dimensional poverty. This method assigns statistical and data indicators to each dimension and defines "deprivation cutoffs" (threshold levels of each statistical or data indicator). If an individual is below the deprivation cutoff in a dimension, they are considered deprived in that dimension. The deprivation indicators of each of the dimensions are then aggregated for each individual, creating a multi-dimensional measure of poverty.

The proposal to adapt AF to measure and aggregate quality of jobs was first developed in Brummund et al. (2018) for benchmarking job quality across the Latin America and the Caribbean region. The AF method has much to offer, particularly a set of properties derived from an axiomatic framework which are relevant for identifying the poor (in our case those with good jobs) and measure poverty (in or case measure job quality), including the ability to combine cardinal data such as labor income and ordinal data as, for example, benefits such as "availability of paid annual leave" into a coherent framework. These properties, although restrictive, have a significant value of a desired measure of good jobs. These are decomposability, replication invariance, symmetry, poverty focus, deprivation focus, monotonicity, nontriviality, normalization.

Critical for any microdata-based measure of job quality across multiple dimensions with a single cut-off for each dimension are *decomposability*, *replication invariance*, and *symmetry*. Decomposability shows that the aggregate job quality measure is a weighted sum of job quality measures of different subpopulations such as workers in different industries or rural and urban workers where the weights are the relative sizes of these subgroups in the total population. Similarly, important to measuring job quality for different groups of interest are replication invariance and symmetry which implies that job quality measured for groups of different sizes are comparable and individuals in these groups are equally contributing to the measure of job quality.

The proposed approach applies the Alkire-Foster framework to success rather than dimensions of deprivation since the focus of this paper to measure the distribution of the (positive) quality of employment along several dimensions globally rather than apply a deprivation standard to an absolute

[15] Missing data for one of the three indicators does not preclude success which is then based on fulfilling *all available* indicators.

benchmark of job quality. This means that if any of the indicators for a dimension are satisfied, the dimension overall is considered a success and is set equal to 1. The working conditions dimension is unique in that all indicators need to be satisfied to have success. Therefore, a higher JQM indicates greater job quality (whereas a higher AF poverty measure indicates greater levels of poverty). The Job Quality Measure can be formally written as follows:

$$JQM_i = \sum_{d,i} w_d I_{d,i} \qquad (1)$$

where JQM_i is the job quality measure for individual i; $I_{d,i}$ is an indicator function set equal to 1 if individual i's job is a success in dimension d and w_d are the weights assigned to each dimension. The JQM sums the successes across dimensions, and we assume that dimensions are weighted equally with unity weights to highlight the difference to deprivation indices. Measuring job quality in this manner will lead to a job quality score of 0 if an individual is employed with a job that does not meet any of the criteria of success in all dimensions. An individual with a job that has successes in all four dimensions captured by the data receives the maximum job quality score of 4.

Whether each dimension should be equally weighted is debatable. In the case of linear aggregation indices where the success within each dimension is based on indicator functions as in the AF method, weights take on the sole role of normatively determining the relative importance of each dimension.[16] The crucial issue is how to identify the appropriate weights. There are various weighting options for multidimensional indices of which the equal weights approach is the standard practice in the field (Decancq & Lugo, 2013; World Bank, 2018). Equal weighting can be justified if there is uncertainty about the relative importance of the dimensions or if the intention is to minimize intervention (Brandolini & D'Alessio, 1998; Mayer & Jencks, 1989). Moreover, it is recommended if there are no compelling reasons to consider some dimensions more important than others (Alkire & Foster, 2011). In the case of job quality, however, it can be argued that remuneration is the most important dimension and therefore we conduct sensitivity analysis giving a higher weight to that dimension (see section 4). Other approaches to the selection of weights are those based on revealed preferences of the population. Although these data-driven methods would reduce arbitrariness, it would not allow for international comparison given that there is considerable heterogeneity in revealed preferences on job quality components such as pay, stability, or flexibility in the population and across countries (Wiswall & Zafar, 2018, Kumar et al. 2019, Assy et al. 2019). Nevertheless, it would be interesting to consider this alternative for future work.

One word of caution of adapting the AF is that unlike multidimensional poverty where it is clear that more income, more schooling, better health, and insurance coverage is preferable, the statistical indicators, and definitions of success for job quality measurement are less clear. For example, revealed preference studies have shown that there is a large variation in preferred number of hours to work in a week (Wiswall & Zafar, 2018). An individual that enjoys their work or is paid by the hour, may prefer to work more hours, or they may not.

[16] In contrast, other multidimensional indices such as the Human Development Index do not use indicator functions and in addition to weights the marginal rate of substitution between dimensions can be non-constant.

c. Country coverage and ex-post harmonization of data on job quality

The ideal measurement approach to job quality provides detailed information for all working individuals on each of the four dimensions for all jobs including potential secondary and tertiary employment. At the same time, compared to multidimensional poverty measures, job quality attributes are not systematically collected in all surveys. The quality and availability of microdata for dimensions of job quality varies across countries, within countries across different employment types such as wage workers or the self-employed, as well as between primary, secondary, or tertiary jobs on the individual observation level. Therefore, the main three potential data constraints are: insufficient overlap of relevant survey questions; insufficient overlap of categorial definitions such as for employment status; and low share of valid responses to survey questions.

To construct the job quality measurement defined in the previous section this study embarks on the endeavor of ex-post data harmonization across developing countries. To compile the harmonized dataset of job characteristics and demographic attributes, we identified 40 countries with household or labor force surveys that contained questions that were both comparable across countries and pertinent to job quality. Our resulting sample spanned all region and income groups. The 40 countries include: 12 in the Sub-Saharan (SSA) Region, 6 in the East Asia and Pacific (EAP) region, 12 in the Latin America and Caribbean (LAC) region, 2 in the Europe and Central Asia (ECA) region, 6 in the South Asia (SAR) region, and 2 in the Middle East and North Africa (MENA) region.[17] Survey selection for each country depends on which survey contains more relevant employment information. For many countries, the choice of a survey is a tradeoff between the availability of detailed household income and expenditure in household surveys, and extensive employment modules in labor force surveys. Table A.1 in the Annex shows the list of available surveys by country-year included in this study (Table A1 in the Annex also show the latest available GDP per capita, poverty headcount ratio, and job quality measure for wage employees). The countries included in this study range from low-income and IDA-eligible countries to high income countries, across all regions.

The ex-post harmonization of data to estimate quality of jobs across developing countries is one of the main contributions of this paper, but not all survey questions are available across countries. This variation in data coverage and availability presents a challenge when measuring job quality globally. To overcome this constraint and increase coverage, it is common to include more indicators that are substitutes of each other. However, carelessly including more indicators to overcome the lack of survey question availability may reduce comparability across countries and render the JQM meaningless. Furthermore, employment related surveys are subject to a country's regulatory framework. For example, if health insurance or pensions are state sponsored, an employment survey may not contain questions regarding social protection coverage at work. To construct a JQM that is both broad in scope and true to its intended use, the process of selecting survey questions to serve as indicators needs to be carefully considered. Indicators must be pertinent to each dimension but also available and comparable across the set of countries being measured. To ensure availability and comparability, it is best to develop a set of indicators among the countries that are the most resource deprived first and expand the from there. To maintain consistency with the literature, this paper selected indicators that are widely cited for each of the dimensions and listed in table 1.

[17] The labor force and household surveys are not publicly available.

d. Data limitations and dimensions considered for measuring job quality

Given the tension described above between completeness of data for one country versus producing comparable measures of job quality across the developing world, the approach as laid out in the methodology section follows Brummund et al. (2018) and develops a practical measure based on information available for most countries instead of limiting this study to a few countries with rich data. Data availability on all four dimensions of job quality varies between countries as labor force surveys or labor modules in household surveys are a reflection of the labor market and regulatory environment of a country. For example, economies with a mainly casual labor force use more questions understanding the hazards and working conditions of employees while countries with strong regulatory frameworks and mostly formal labor force provide detailed information on benefits and income but less on working conditions.

Coverage of the four dimensions also varies between employment types within countries. Surveys usually distinguish between four main employment types (wage employment, self-employment, unpaid employment, other such as apprenticeship) and divide the questionnaire into a comprehensive set of questions for wage employees and a short questionnaire for all other employment types. For most countries, coverage of the other employment types is therefore much more limited than for wage employees. Household surveys may provide income information for self-employed individuals in the earnings or household enterprise modules but at the expense of a shorter labor module for wage employees. When both household and labor force surveys are available, the labor force surveys provide a better coverage of the four dimensions even if only for wage employees. The paper focuses on labor force surveys and =wage employees.

Based on the set of 40 countries, of the four dimensions (income, benefits, security, working conditions) the two most widely covered dimensions are income and working conditions, followed by security, and benefits. As discussed earlier, very little additional information is available to capture a separate potential fifth and sixth dimension of safety, and training, respectively. This analysis takes into account not only availability of survey questions, but also the share of valid responses to survey questions, the implicit assumptions built into the questionnaire such as whether universal health care should be provided, as well as how much additional information is gained from including an indicator. Indicators that are found to be positive for virtually all respondents such as subjective skill match do not add much information, for example.[18] Driven by availability of data across countries, our analysis therefore focuses on four main dimensions of quality of jobs and only one category of workers: wage workers. The four dimensions of job quality covered by the harmonization exercise are: a) sufficient income to be moved out of poverty and into the lower middle-class; b) having benefits c) stability of employment; d) and adequate working conditions. This restriction to focus on a subset of dimensions due to data constraints is shared with the literature while this paper expands the scope of countries included to all regions. Table 2 provides a summary of the four dimensions, their indicators, and the definition of each indicator for the final set of survey indicators. This table shows there is one indicator for the income dimension; six indicators for the Benefits dimension; four indicators for the Stability dimension; and three indicators for the Working Conditions dimension.

[18] Subjective indicators such as skill-match rarely result in respondents confessing that they are underqualified.

Table 2: Job Quality Dimensions and Indicators

DIMENSION	INDICATOR	DEFINITION OF QUALITY
Income	Out of poverty (and into the lower middle class)	Total wages exceed the country-income group specific poverty line multiplied by the dependency ratio of (4/1.5)
Benefits	Health insurance	Job provides health insurance
	Unemployment insurance	Eligible for unemployment insurance
	Pension contributions	Job associated with pension benefits
	Social security	Job associated with any type of social security
	Annual paid leave	Job offers paid holiday leave
	Paid sick leave	Job offers paid sick leave
Stability	Tenure	3+ years of tenure in job for workers age 25-64, 1+ years of tenure in job for workers age 15-24
	Written contract	Employment is bound by written contract
	Permanent employment	Employment is permanent, not temporary
	Formal employment	Employer is formal company (registered with authorities, or keeps written accounts or public employer)
Working Conditions	Excessive working hours	Individual does not exceed 48 weekly hours
	Second paid job	Individual does not work a second paid job
	Direct question: *would you like to work more?*	Individual responds "no"

Note: This table shows the dimensions and indicators including their definitions that comprise the JQM.

Table A2 in the Annex shows the availability of these indicators across countries and provides insight to the existing gaps in this global data harmonization effort, as data for some countries include most indicators, while others only a few. Three countries (Panama – PAN, Philippines - PHL, Thailand - THA) do not have an indicator for the benefits dimension and some countries only have one indicator in a given dimension. On the other hand, some countries have multiple indicators available in each dimension, such as Bangladesh (BGD). The only indicators available in all countries are the daily wage and hours worked. There is a significant share of item non-responses and thus missing entries in the data. Table A3 shows the share of missing entries for each indicator and country. If an indicator is omitted from a survey, or if all individuals neglect to answer the survey indicator question, the share is 100%. For most questions, the share of missing observations is very low, but Table A3 exhibits the advantage of using multiple indicators for each dimension. For example, Sri Lanka (LKA) has three of four indicators for the benefits dimension. For these three indicators, however, the share of missing values ranges from 16 percent (paid leave) to 36 percent (social security). From a harmonization perspective, it is not possible to determine whether the missing data entry is a true "missing", or whether the survey only recorded positive answers.

Labor force and household surveys classify employment types differently. For example, labor force surveys distinguish between several types of workers and often have country-specific employment categories. For the countries in which we rely on household surveys, only general employment statuses are available. As a result, this paper chooses four broad employment categories as dictated by the survey[19] with the fewest categories: *wage employees* (formal or informal); *self-employed workers*; *unpaid workers*; and *other workers*.[20] The data quality across employment types is not the same. Self-employed workers consistently lack information for many indicators. For instance, labor income for self-employed is missing

[19] The 2017 Labor Force Survey in Turkey

[20] *Other workers* includes employers and individuals with job descriptions do not align with the other three categories, such as apprentices.

across most surveys and it was not possible to approximate labor income with household income or consumption. This paper thus focuses on wage employees only. While a large share of workers in developing countries are self-employed or non-paid family workers, focusing the harmonization exercise and measuring job quality on the four dimensions for wage employees only is a worthwhile exercise. The information on these workers not only offers to give the fullest picture of job quality that is currently available, but wage workers are likely to have the highest job quality among these groups of workers and their job quality represents an upper bound for the countries and subpopulations analyzed.

Although subsistence agriculture and self-employment are two of the largest sources of employment in lower and lower-middle income countries and include the most vulnerable groups of workers, for these labor market participants, survey data is extremely limited at best, and unreliable at worst. Therefore, the subsequent analysis on job quality focus on the four dimensions defined above for wage employment across the 40 countries. For all countries, the sectors of employment are aggregated into 10 industry designations: agriculture, mining, manufacturing, utilities, construction, commerce, transport and communication, finance and business, public administration, and other services. These can be further aggregated into agriculture, manufacturing (mining to construction), and services (commerce to other). Observations without an employment category or industry are dropped. Finally, each survey sample is partitioned to include individuals age 15 to 64 that worked at least one hour for pay within the last 7 days of the survey interview.[21] Survey questions related to secondary jobs are not included given the limited information available and our indicators measure primary occupations only.[22]

4. Results

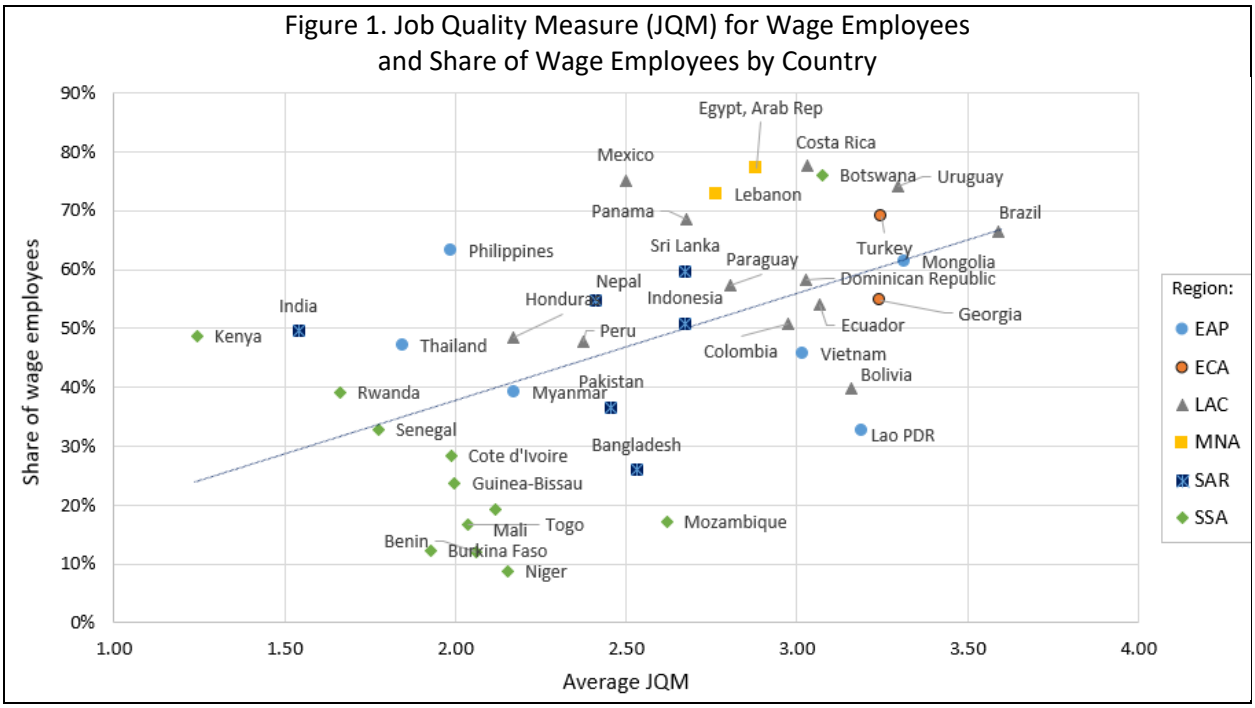
a. Job Quality Measure (JQM) across countries, sectors, and socio-demographic groups

This study develops a Job Quality Measure (JQM) for wage employees in 40 developing countries representing different regions. The analysis indicates that there is strong positive correlation between the JQM and the share of wage employed in total across countries as shown in Figure 1. Some patterns emerge across the regions: most countries from Sub-Saharan Africa are in the lower left corner (notably except Botswana), having low levels of share of wage employees and low JQM averages. These countries are characterized as agrarian economies, where the main avenue to improving living standards has been focused on farming and promoting labor reallocation from rural to urban areas (World Bank, 2012). Most countries in the East Asia and Pacific region exhibit average job quality, while most Latin American countries have higher job quality. These inter-regional differences showcase the relevance of the global scope for measuring job quality in contrast to prior studies that focus on the country and regional levels.

[21] This excludes individuals who were employed but did not work during the 7 days leading up to the interview as many surveys do not show income information for these individuals. In some cases, only information about the past month is available.

[22] Surveys do not provide the same level of detail for secondary jobs as for they do main jobs. The only information obtained regarding secondary jobs is whether an individual is employed and earning a wage in a second paid job. This information is used for the *second paid job* indicator in the satisfaction dimension.

Figure 1. Job Quality Measure (JQM) for Wage Employees and Share of Wage Employees by Country

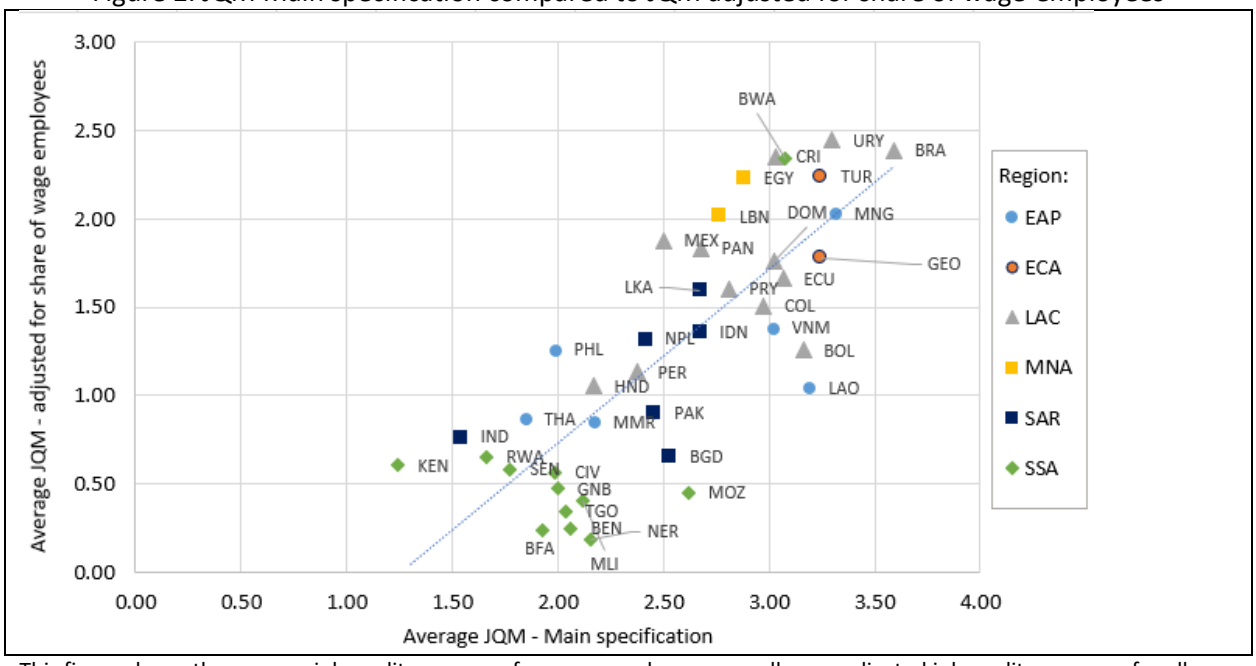


This figure shows the average job quality measure for wage employees and the share of wage employment among all workers in the sample of 40 countries covering all regions.

Despite the positive correlation cross-country correlation between the JQM and the share of wage employed, Figure 1 also shows that the JQM can vary significantly for countries with similar shares of wage employees and, in turn, that the share of wage employees can vary considerable for countries with similar JQM. For example, Turkey, Lao and Bolivia have very similar JQM at 3.25, 3.19, 3.16, respectively, but very different share of wage-employees: 69%, 33%, and 40%, respectively. Given that self-employed individuals usually hold precarious jobs, one would expect a much greater difference in overall job quality in Turkey compared to Lao and Bolivia if self-employed individuals were included in the analysis. To evaluate how much results would change by including self-employed workers, we weight our country average measure of job quality the share of wage employees in that country. This is equivalent to assuming that self-employed had a job quality score of zero (the lowest possible score). Figure 2 shows a strong correlation between these two measures but also a non-trivial extent of variation. As expected, the differences in job quality between Turkey, Lao and Bolivia are much higher using this alternative measure, at 1.26, 0.60, and 0.76, respectively.

The analysis of individual dimensions of JQM shows substantial variations across countries in in all dimensions (Figure 3). The highest average values for the four dimensions range from 0.91 to 0.98 and the lowest values span from 0.07 to 0.21. The dimensions that show greater variation are benefits and stability. The countries with largest averages for the benefits dimension are Uruguay and Mongolia, with values of 0.95 and 0.84 respectively in that dimension, while the countries with lowest averages are Rwanda and Peru, with values of 0.08 and 0.07 respectively. For the stability dimension, the countries with largest averages are Ecuador and Mongolia, with values of 0.98 and 0.96 respectively and the countries with lowest averages are Kenya and India, with values of 0.28 and 0.14 respectively. The comparability across countries comes with certain challenges arising from the harmonization efforts.

Figure 2. JQM Main specification compared to JQM adjusted for share of wage-employees



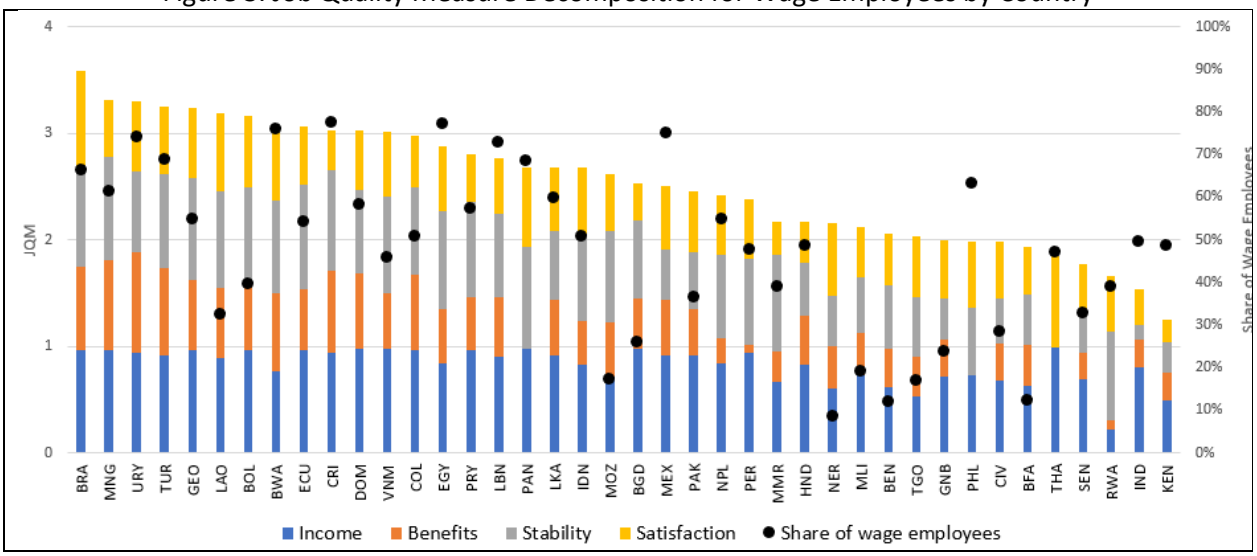
This figure shows the average job quality measure for wage employees as well as an adjusted job quality measure for all workers which assigns a score of 0 to non-wage workers.

Interesting patterns emerge when comparing the JQM across economic sectors using cross-country data (Figure 3). The three sectors with the highest JQM include public administration, finance and business services, and the (often public) utilities. Jobs in these sectors generally score higher in each dimension but particularly in the benefits and stability dimensions. The average scores in these dimensions of the three top sectors are 0.25 and 0.33 points higher than the average scores in these dimensions for the seven other sectors, while their average scores in the income and working conditions dimensions are higher by between 0.09 and 0.15 points. These sectors are also the ones with the highest share of wage employees. At the other end of the spectrum, the low-skill sectors of agriculture and construction have the lowest JQMs. Agriculture workers have significantly lower scores than the rest of economic sectors in all dimensions except working conditions, while construction workers fare particularly poorly in the benefits and stability dimensions.

The discussion of the four dimensions across industries illustrates the richness of the JQM that does not rely on one exclusive indicator to measure the quality of jobs. Two common single indicators used to measure the quality of jobs in the literature are income and whether the job is formal. Table 3 shows the comparison in ranking when using single indicators and JQM. This analysis is restricted to the sample of 22 countries with information on all dimensions and the formality indicator[23]. There are a few differences between the industry ranking based on JQM developed in this paper and the one based on the share of formal workers widely used in the literature. For example, commerce moves down one position in the JQM based ranking as JQM penalizes commerce because even though its score in the stability dimension is not that low (which includes formality as one of the indicators), it does not fare that well in the other

[23] The formality indicator is only one of four stability indicators and not available (nor necessary) to measure stability in all 40 countries.

Figure 3. Job Quality Measure Decomposition for Wage Employees by Country



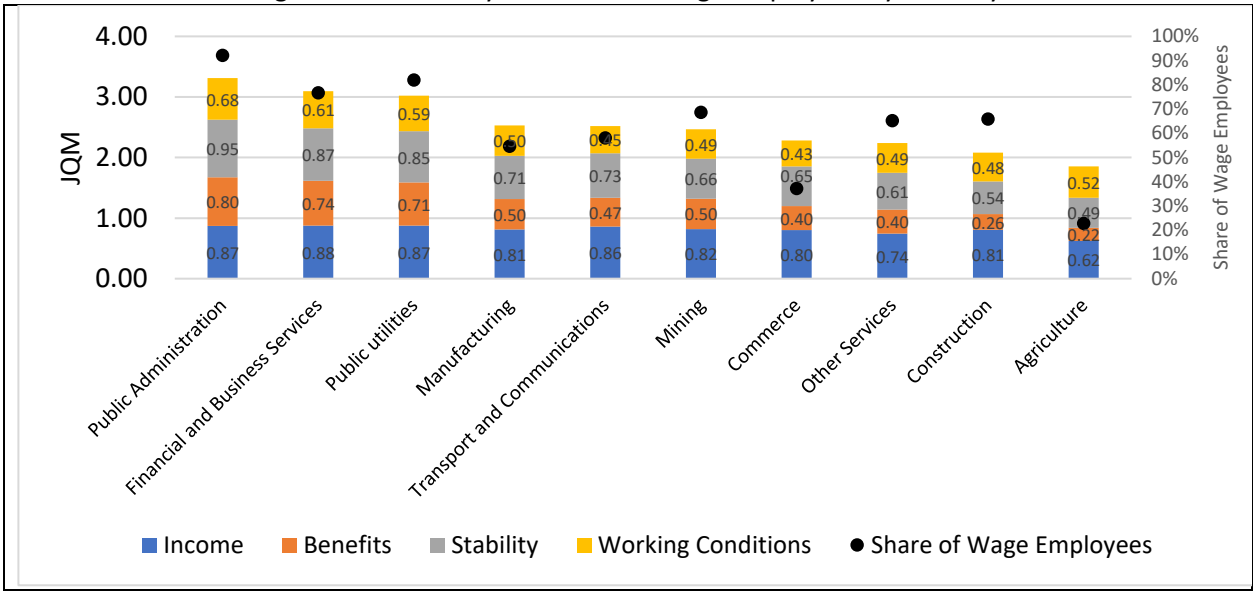
Notes: This figure shows JQM by country for wage employees only. The JQM is comprised of 4 dimensions, and the highest possible JQM attainable for an individual is equal to 4.

dimensions particularly in the working conditions dimension in which commerce is the lowest ranked sector (Figure 3). Also, several differences emerge when comparing the JQM-based industry ranking to the one based on median income across sector. Manufacturing moves up two positions and construction moves down two positions according to the JQM based ranking. Again, these sectors are being accordingly rewarded or penalized based on their scores in other dimensions (Figure 3)[24].

Gender disparities exist around the globe, although there has been progress in key areas over the past years, especially in the labor force participation and in access to tertiary education. Women now represent 40 percent of the global labor force, 43 percent of the world's agriculture labor force, and more than half the world's university students. Over the past quarter century, women have joined the labor market in increasing numbers, closing the gender participation gap. Between 1980 and 2009, the global rate of female labor force participation increased from 50.2 percent to 51.8 percent, while the male rate fell from 82.0 percent to 77.7 percent (World Bank, 2012). While the rise in female labor force participation is a significant development it only represents employment or intent to get a job. Disaggregating the JQM by gender would help inform the degree of gender gaps in quality of employment. Figure 5 presents JQM for wage employment disaggregated by gender. The results show that JQM is on average very similar between men and women. However, the JQM decomposition by the four dimensions reveal that women fare especially well in the working conditions dimension while men fare much better in the income dimension. Men earn more than women even though their selection in wage employment is somewhat lower than for women: on average across countries 49% of male workers are wage-employees whereas this is the case for 43% of female workers. This statistic hides substantial variation across countries. In line with other studies (World Bank, 2012), we find that women are significantly underrepresented in wage-employment in low and lower-middle income countries whereas that is not necessarily the case in upper middle-income countries. Moreover, we find that the level of selection of women into wage-employment is not correlated with the difference in JQM by gender at the country level (Appendix Figure A9).

[24] Even though the samples of countries between figures 3 and 4 differ, the general statements made in this paragraph apply to both samples.

Figure 4. Job Quality Measure for Wage Employees by Industry



Notes: This figure shows JQM by industry for wage employees only and the share of wage employees among all workers. These are simple averages across 37 countries in the sample (Panama, Philippines and Thailand were excluded because they do not have information for one or more dimensions). The average of the stability dimension for public administration is not equal to one (which could be the case given that all public administration workers have a formal employer and therefore have stability according to our definition) because some countries do not have information on formality for private sector workers and thus, we do not include the formality indicator to calculate the stability dimension in these countries.

Table 3. Ranking of industry sectors according to different indicators

Single indicator: Formality			**Composite indicator: JQM**			**Single indicator: Income**		
Industry sector	Ranking	Share formal	Industry sector	Ranking	Average JQM	Industry sector	Ranking	Median income
Public Administration	1	100%	Public Administration	1	3.42	Public Administration	1	7,671
Financial and Business Services	2	76%	Financial and Business Services	2	3.09	Public utilities	2	7,095
Public utilities	3	74%	Public utilities	3	2.99	Financial and Business Services	3	6,951
Transport and Communications	4	59%	Transport and Communications	4	2.46	Mining	4	6,524
Manufacturing	5	51%	Mining	5	2.44	Transport and Communications	5	5,803
Commerce	6	48%	Manufacturing	6	2.39	Other Services	6	5,429
Mining	7	48%	Other Services	7	2.28	Construction	7	5,043
Other Services	8	40%	Commerce	8	2.17	Manufacturing	8	4,816
Construction	9	30%	Construction	9	2.01	Commerce	9	4,723
Agriculture	10	21%	Agriculture	10	1.69	Agriculture	10	2,888

Notes: Samples includes 22 countries with information on all dimensions and on the formality indicators. Income corresponds to annual median income measured in USD 2011 PPP. The gray / green arrows indicate movements in ranking positions of an industry sector where its JQM ranking position is lower / higher compared to its single indicators ranking position.

Figure 5. Job Quality Measure for Wage Employees by Sex

Notes: Sample includes 37 countries with information for all dimensions. This figure shows JQM by gender for wage employees only and the share of wage employees among all workers by sex.

Women fare slightly better than men when relying solely on the formality indicator but the ranking reverses when using the median income indicator (see Table 4). These are averages among the 22 countries in the sample but there is a significant heterogeneity across countries for the JQM and the formality indicator. The JQM and the share of formal workers is higher for women in 14 and 12 of these countries respectively, but the opposite is true in the remaining countries of the sample. Similar heterogeneity is found when using the World Development Indicator (WDI) of formality for non-agricultural workers[25]. There is information on this indicator for 19 countries in the sample. In this case, in 6 of these countries the share of formal workers is higher for women. In contrast, there is almost no heterogeneity across countries when using the median income indicators. In almost all 22 countries (except Niger), men have a higher median income than women.

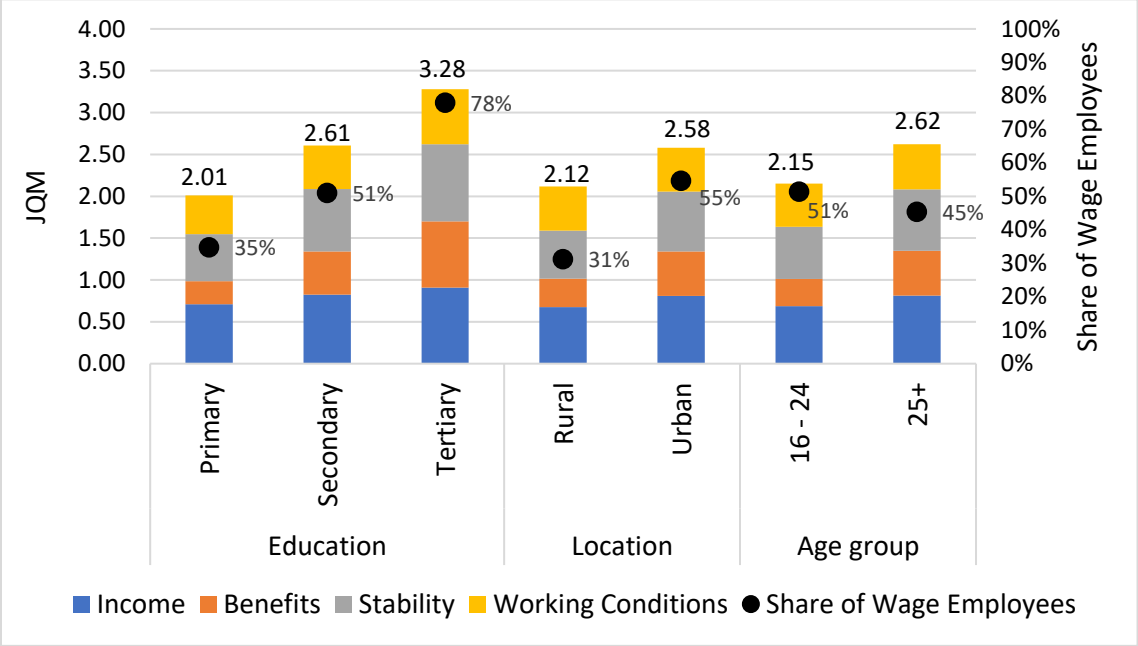
Table 4. Ranking by sex according to different indicators

Single indicator: Formality			**Composite indicator: JQM**			**Single indicator: Income**		
Sex	Ranking	Share formal	Sex	Ranking	Average JQM	Sex	Ranking	Median income
Women	1	59%	Women	1	2.59	Men	1	5,540
Men	2	56%	Men	2	2.50	Women	2	4,277

Notes: Samples includes 22 countries with information on all dimensions and on the formality indicators. Income corresponds to annual income measured in 2011 PPP. The gray / green arrows indicate movements in ranking positions of an industry sector where its JQM ranking position is lower / higher compared to its single indicators ranking position.

[25] This indicator is available in the WDI site, see an example comparing the World Median to Brazil: https://tcdata360.worldbank.org/indicators/d1ccc31a?country=BRA&indicator=28114&viz=line_chart&years=2000,2019. The values of this formality indicator can significantly differ from the values of our formality indicator for a number of reasons, including different definitions and samples of workers.

Figure 6. JQM for Wage Employees by Education, Location, and Age Groups



Notes: Sample includes 37 countries with information for all dimensions. The sample for the education graph further excludes two countries without information on education and the sample for the location graph further excludes nine countries without information on location.

There are other disaggregations of the JQM that can be informative in understanding the disparities in the job market. Common disadvantaged groups are those less educated, those living in rural areas and the youth. In some countries young people usually have unpaid jobs and even if paid, they are less likely to have social insurance.[26] Figure 6 shows the JQM for wage employees by education, location and two age groups (16-24 years old - *the young*, and 25 and older workers). The starkest difference is shown by education. Those with secondary education have an average JQM that is 30 percent higher than those with primary education, and those with tertiary education have an average JQM that is 26 and 63 percent higher than those with secondary education and primary education, respectively. The scores of each dimension are higher for the higher educated workers but the difference is especially pronounced for the benefits dimension, where the scores of the tertiary and secondary educated are almost three times or twice higher, respectively, than the scores of the primary educated. The difference between individuals living in urban and rural areas and younger and older individuals are similar. The average JQM of urban and older individuals is on average 22 percent higher than the average JQM of rural and younger individuals, respectively. Again, the greatest difference is found in the benefits dimension in both cases.

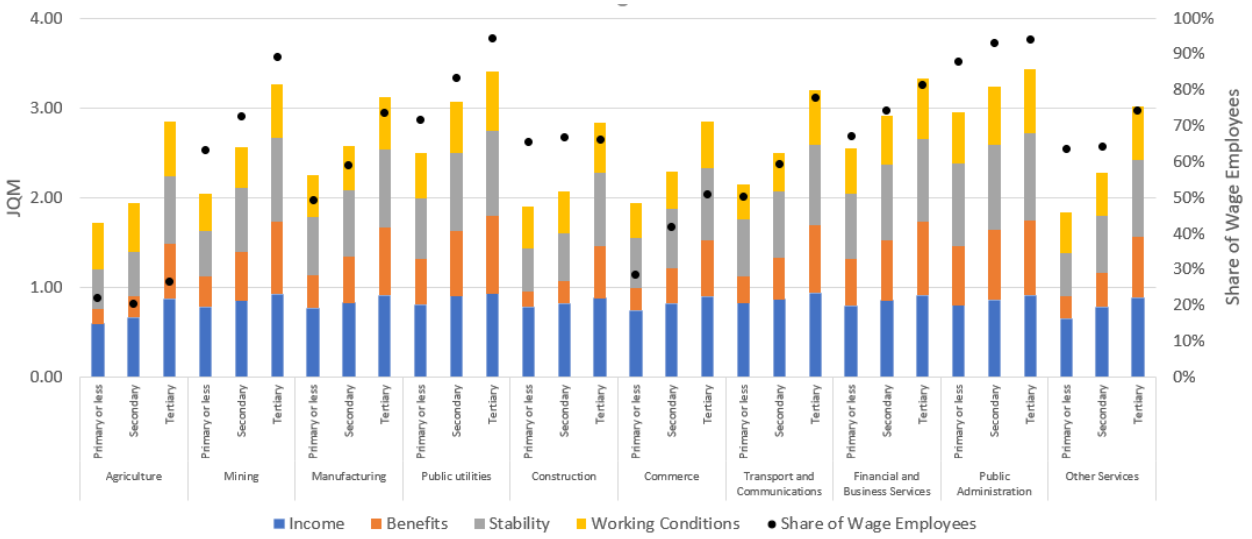
Workers' allocation across sectors highly depends on their education level. For example, on average almost half of wage employees with primary education work in agriculture as opposed to only less than a fourth of wage employees with secondary education and only five percent of those with tertiary education. The case reverses for the public administration sector. To explore to what extent education drives the differences in JQM within industries, industry JQMs are further disaggregated into education groups as shown in Figure 7. Higher education secures greater job quality, with greater scores in all

[26] (World Bank, 2012). World Development Report: Jobs.

dimensions but especially in the benefits dimension within all industry groups. Moreover, for those industries with relatively low scores in some dimensions for lower educated individuals, the education premium is greater. For example, agriculture has a very low score in the income dimension for wage employees with primary education (0.59 versus an average of 0.77 for other industries). The income dimension scores for tertiary educated relative to primary educated is 0.28 higher in agriculture respectively, compared to 0.14 higher on average for other industries. Similarly, the education premium for stability is particularly high for the mining, construction and other services sectors that have relatively low scores in that dimension for low educated individuals.

Figure 7 also shows that there is a substantial variation in the JQM for each education group across industry sectors. As expected, low-productivity sectors such as agriculture, construction, and commerce exhibit relatively lower JQM for tertiary educated workers as opposed to high-productivity sectors such as mining, utilities, and financial and business services. The public administration JQM scores highest for tertiary educated workers as well as for other education groups. Among the JQM dimensions, income typically has the highest score for all industries and education groups (except for public administration where stability has the highest score). Interestingly, the JQM dimensions can vary largely among low-skill sectors such as agriculture and commerce. For example, income and working conditions dominate the JQM in agriculture, while income and stability are the strongest dimensions in commerce.

Figure 7. Job Quality Measure for Wage Employees by Industry and Education

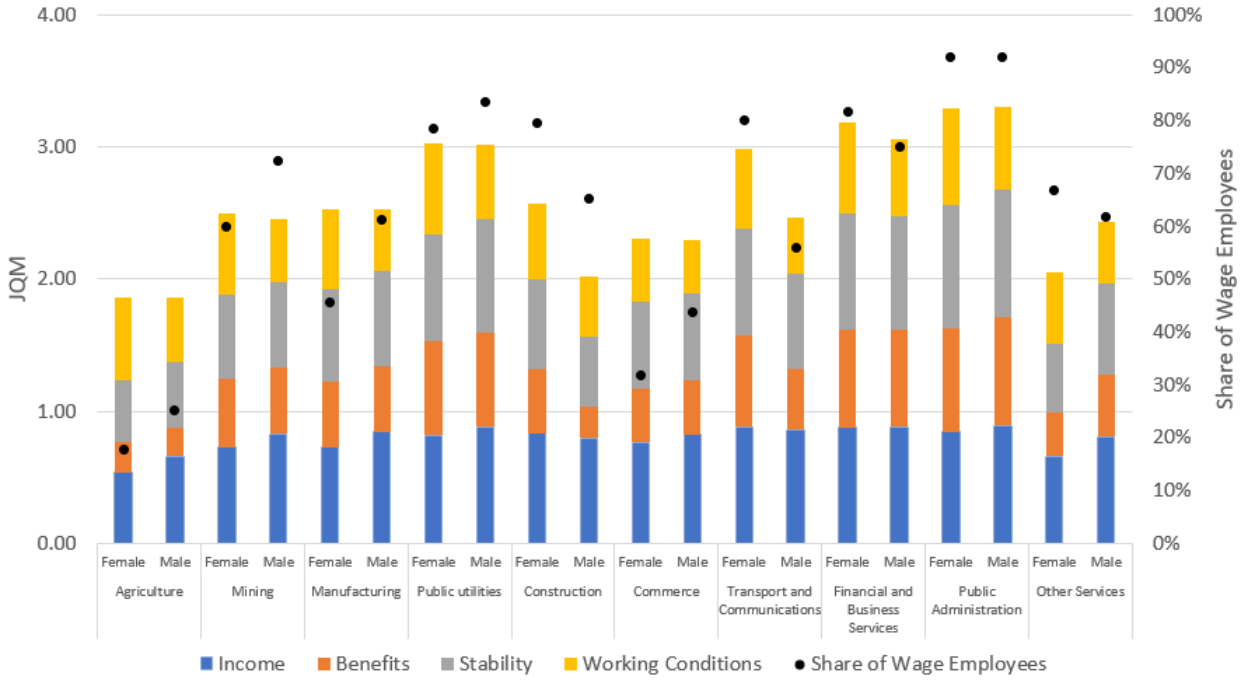


Notes: Sample includes 35 countries with information for all dimensions and education level. This figure shows JQM by industry, disaggregated by education level, for wage employees only.

Regarding gender disparities within industries, the results do not show significant differences except in three sectors: construction, transport and communications, and other services (Figure 8). In construction, and transport and communications, women have an average JQM that is 27 and 21 percent higher than the average JQM for men respectively. On average, only 1 - 2 percent of female wage-employees go into these sectors, compared to 8 - 10 percent in the case of male wage-employees. Presumably those women who self-select into these sectors do so because they expect to have a good job there due to either their

ability or their training. In the other services sector, men's average JQM is 16 percent higher than women's average JQM. Women and men may be choosing very different occupations in this case since the other services sector encompasses a wide range of occupations.

Figure 8. Job Quality Measure for Wage Employees by Industry and Sex



Notes: Sample includes 37 countries with information for all dimensions. This figure shows JQM by industry, disaggregated by sex, for wage employees only.

Given that the characteristics by which we disaggregate the JQM are usually correlated, to better understand what characteristics the main predictors of job quality are, the paper follows Brummund et al (2018), and runs the following regression to identify conditional correlations:

$$JQ_{jsc} = \alpha + \beta X_{jsc} + \gamma_2 Sector_s + \gamma_3 Country_c + \epsilon_{jcts} \quad (2)$$

where JQ_{jtcs} is the level of job quality for individual *j*, working in sector *s*, in country *c*; X_{jtcs} is a vector of covariates that may help inform policy interventions; and $Sector_s$ and $Country_c$ are country and sector fixed effects.

The results from the OLS regression in Equation (2) are presented in Table 5. Column 1 shows results including all countries with available information, and columns 2-5 show results for countries in particular regions (we exclude the Europe and Central Asia, and the Middle East and North Africa regions because our sample only has two countries in those regions). There are some notable differences across regions, which again stresses the relevance of the global scope of the job quality measure. Particularly, the impact of being male on JQM is only statistically significant for the Latin America and the Caribbean region. Education and urban locations are statistically significant in all regions but to a lesser extent in the East

Table 5. Predictors of Job Quality across Regions

	All	LAC	EAP	SAR	SSA
	(1)	(2)	(3)	(4)	(5)
Age	0.0121***	0.00504**	0.00612*	0.00981**	0.0200***
	(0.00160)	(0.00171)	(0.00207)	(0.00102)	(0.00204)
Male	0.0880***	-0.00256	0.0201	0.111	0.0715
	(0.0280)	(0.0224)	(0.0566)	(0.0434)	(0.0412)
Education: Secondary	0.440***	0.303***	0.179	0.444*	0.474***
	(0.0344)	(0.0544)	(0.0953)	(0.128)	(0.0391)
Education: Tertiary	0.696***	0.474***	0.542*	0.841**	0.935***
	(0.0592)	(0.0628)	(0.171)	(0.170)	(0.0782)
Urban	0.165***	0.175***	0.124	0.115	0.165***
	(0.0189)	(0.0394)	(0.0571)	(0.0474)	(0.0396)
Sector: Mining	0.390***	0.505***	0.588*	0.448	0.299**
	(0.110)	(0.129)	(0.210)	(0.218)	(0.0983)
Sector: Manufacturing	0.509***	0.549***	0.460**	0.556*	0.303**
	(0.0787)	(0.164)	(0.120)	(0.149)	(0.116)
Sector: Utilities	0.615***	0.472**	0.392**	1.029*	0.688***
	(0.116)	(0.204)	(0.0963)	(0.310)	(0.143)
Sector: Construction	0.140***	-0.0145	0.413**	0.0904	0.214*
	(0.0487)	(0.0731)	(0.0784)	(0.0536)	(0.105)
Sector: Commerce	0.217***	0.276**	0.359***	0.0276	0.0296
	(0.0585)	(0.103)	(0.0372)	(0.0259)	(0.0959)
Sector: Transport and Communications	0.291***	0.312***	0.203	0.206	0.382***
	(0.0509)	(0.0944)	(0.0898)	(0.0733)	(0.0990)
Sector: Financial and Business Services	0.672***	0.533***	0.723**	0.772	0.722***
	(0.0808)	(0.138)	(0.189)	(0.267)	(0.158)
Sector: Public Administration	0.952***	0.616***	0.533**	0.737	1.398***
	(0.116)	(0.135)	(0.157)	(0.457)	(0.146)
Sector: Other Services, Unspecified	0.0898	-0.165	0.284**	0.0567	0.212**
	(0.0618)	(0.113)	(0.0732)	(0.106)	(0.0926)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.455	0.331	0.429	0.438	0.464
Observations	550,768	268,029	98,640	112,832	60,273

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
The sample includes 33 countries (11 in LAC, 11 in SSA, 4 in EAP, 3 in SAR, 2 in ECA, and 2 in MNA). Each country is given equal weight in the regressions.

Asia and the Pacific, and South Asia regions. Regarding the industry sector, in general all sectors have a positive impact on job quality compared to agriculture, the omitted category. However, the statistical significance of the effects is much lower in the South Asia region and sometimes they are not statistically significant.

The paper conducts a number of sensitivity analysis of our job quality measure using six alternative income thresholds: i) the lower-middle income international poverty line of US$3.20 (PPP 2011) and keeping the same dependency ratio, ii) the upper-middle income international poverty line of US$5.50 (2011 PPP) and keeping the same dependency ratio, iii) using flexible international poverty line according to the income level of the country and keeping the same dependency ratio, iv) keeping the extreme international poverty line of US$1.90 (PPP 2011) but using a dependency ratio of 2, v) using each country's median income, and vi) using each country's minimum wage. Average country job quality measures are similar and country rankings are quite stable when comparing the main specification and specifications using these alternative income thresholds (Appendix Figures A1-A6).

Furthermore, we include sensitivity tests giving more relevance to the income dimension than to the other dimensions given that it can be argued that remuneration is the most important aspect of job quality. We conduct two sensitivity tests in this regard: i) giving the income dimension a weight that doubles the weights given to the other dimensions, ii) keep equal weights for all dimensions but censor job quality as 0 (the lowest possible score) if the daily wage is below the threshold. These alternative specifications also provide similar results to those obtained with the main specification (Appendix Figures A7-A8).

b. Comparing our JQM to standard definitions of informality

We showed previously how our JQM provides richer information than single indicators. In this section, we conduct a more detailed analysis focusing on standard definitions of informality used in Latin American countries. We show that workers with very different levels of job quality can be classified in one of the categories of standard binary definitions of informality, and therefore information that can be useful for the effective targeting of policies is lost. Using multiple dimensions of Job Quality adds to the understanding of high quality jobs by introducing additional data not captured by the broad common informality concepts.

We use the SEDLAC data set to compare the Job Quality measure with two standardized informality definitions: Productive informality classifies a worker as informal if the firm has five or fewer employees. Legal informality classifies a worker as informal if the job does not have pension benefits. The data contain information on 430K wage workers in 12 Latin American countries. These two definitions of informality capture different underlying working conditions. While 30% of workers are informal according to the productive informality definition, 60% of workers are informal using the legal definition.

Within these two groups of informal wage workers there is large variation both in the informality shares and in the observed job quality across countries, see Figures 11.1a and 11.2a for productive informality and legal informality, respectively. Job Quality is correlated with informality as shown by the linear fit line. At the same time, the figures show three advantages of a well-defined Job Quality measure with multiple dimensions compared to concepts of informality that are based on just one indicator: first, while the share of informal workers in a country varies depending on the informality definition, job quality is stable. For example, just over 20% of workers are considered informal in Brazil using the productive definition, but almost 80% using the legal definition while Job Quality is stable at 0.9. Second, countries with comparable shares of informal workers have, in fact, very different levels of Job Quality. In Figure 11.1a, among countries with similar informality shares such as Honduras, Mexico, Ecuador, and Paraguay job quality varies from between 0.55 to 0.8. Third, and relatedly, countries with similar levels of job quality classify different shares of wage workers as informal. Figure 11.2a shows, using the legal informality definition, that wage workers in the countries of the Dominican Republic, Ecuador, and Bolivia have the

Figure 11: Comparison of our JQM with the productivity and legal definition of informality

Panel 11.1. Comparison to the productivity definition of informality	Panel 11.2. Comparison to the legal definition of informality
Figure 11.1a: At country level	Figure 11.2a: At country level

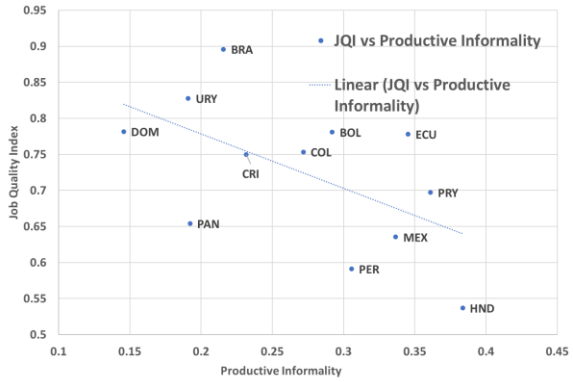
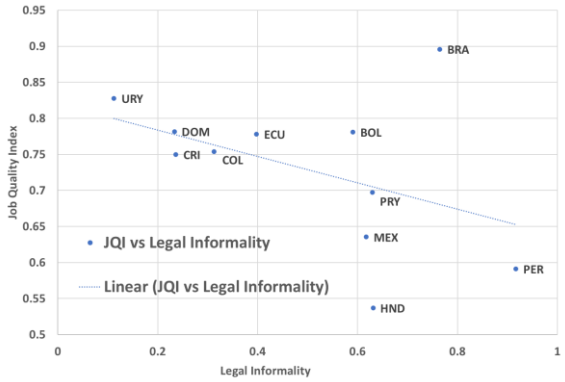
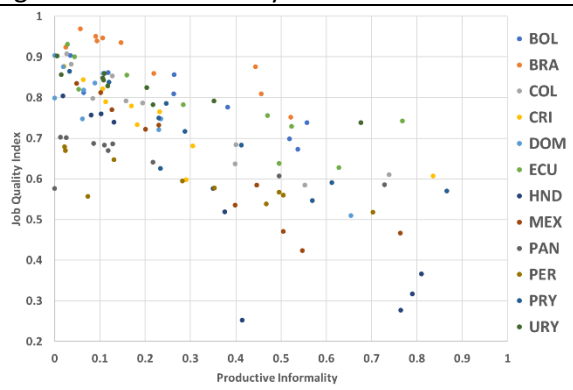
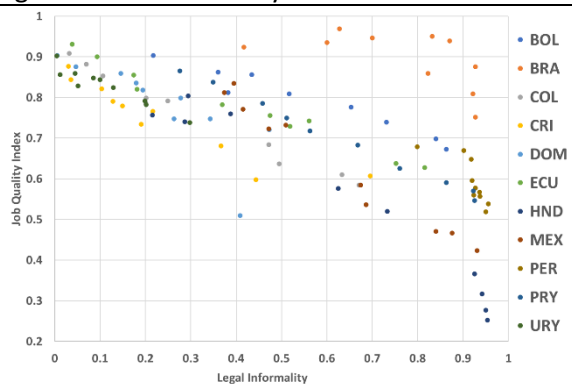

	

Figure 11.1b: At country-economic sector level	Figure 11.2b: At country-economic sector level
	
Notes: Figures 11.1a and 11.1b show the share of informal wage workers according to the productive definition in 12 LAC countries and 10 sub-sectors of the economy and the average (standardized to between 0 and 1) job quality score for these workers. Job quality is correlated with informality as shown by the linear fit line but among countries with similar informality shares such as Honduras, Mexico, Ecuador, and Paraguay job quality varies from between just below 0.6 to 0.8.	*Notes:* Figures 11.2a and 11.2b show the share of informal wage workers according to the legal definition in 11 LAC countries and 10 sub-sectors of the economy and the average (standardized to between 0 and 1) job quality score for these workers. Job quality is correlated with informality as shown by the linear fit line but among countries with similar informality shares in economic sub-sectors, job quality varies greatly. For example, in some sectors in Honduras, Mexico, and Brazil, the share of informal workers is above 90% while Job Quality varies from very low quality jobs at around 0.2 in the Agriculture and Mining sectors in Honduras to 0.88 in the Construction sector in Brazil.

same level of Job Quality, yet Bolivia counts 60% of wage workers as informal, while the Dominican Republic classifies only 20% as informal.

Figures 11.1b and 11.2b show that these three advantages of Job Quality are not due to how informality is measured across countries, but even within countries across sectors. Similar to Figure 11.1a, Figure 11.1b plots the average Job Quality score and informality share of wage workers across 10 sub-sectors of the economy using the productive definition of informality. Figure 11.2b uses the legal definition of informality. A particularly interesting example is Brazil, shown in orange. While, using the productive informality definition, at most 40% of wage workers in any sub-sector are considered informal, 40% to almost 100% of wage workers are considered informal when using the legal definition of informality. Yet, across all sectors, Job Quality is very similar, between 0.75 to 0.95. Furthermore, in Figure 11.2b, across

multiple sub-sectors of Honduras, Mexico, and Brazil, the share of informal workers is above 90% while Job Quality varies from very low quality jobs at around 0.2 in the *Agriculture* and *Mining* sectors in Honduras to 0.88 in the *Construction* sector in Brazil. Using multiple the multiple dimensions of Job Quality which include earnings and working conditions, clearly informal wage workers in Honduras are much worse off than informal wage workers in Brazil.

Table 4. Share of productivity classified informal wage workers in SEDLAC and JQ

Share of informal workers	Share of Workers with Job Quality Levels
Informal (30%)	JQ = 0, 3.1%
	JQ = 1, 30.3%
	JQ = 2, 36.9%
	JQ = 3, 20.3%
	JQ = 4, 9.4%
Formal (70%)	JQ = 0, 0.3%
	JQ = 1, 5.7%
	JQ = 2, 12.8%
	JQ = 3, 31.2%
	JQ = 4, 49.9%

Notes: This table shows the shares of wage workers at different levels of job quality among the formal and informal workers, classified according to the productive definition of informality. A worker is informal if the firm employs five or fewer workers.

The distribution of wage workers across the different levels of Job Quality among the informal and formal workers in SEDLAC as seen in Table 4 and table A8 in the appendix provides strong evidence that using a binary informality definition misclassifies a non-negligible share of wage workers as experiencing low quality of work. In Table 4, among the 30% of wage workers who are classified as informal using the productive definition, almost one third have a job quality score of 3 or 4 and thus do well on all or almost all dimensions of job quality. This high job quality score shows that their jobs are much better than the jobs of the almost one fifth of formal workers who have job quality scores of 2 or lower. Similarly, these informal wage workers with Job Quality scores of 3 or 4 are much better off than the one third of informal wage workers with scores of 0 and 1.

The correlation between Job Quality and the two informality definitions as well as the four dimensions of job quality shows that in particular the income dimension and working conditions dimension add to the analysis of job quality, followed by the stability dimension and benefits dimension, see Table A6 in the appendix. Overall, Job Quality is correlated more with the legal classification of informality at -0.7 considering that having access to pension benefits is one of the job quality criteria, and less with the productivity classification of informality at -0.5.[27] At the same time, both informality classifications are only weakly correlated with the income dimension at around -0.22 each, as well as the working conditions dimension at -0.1 and -0.11. The stability dimension is correlated at -0.47 with legal informality and -0.38 with productive informality. The highest correlation occurs between both informality definitions and the benefits dimension with a correlation of -0.86 for the legal definition which overlaps with the definition of the benefits category, and -0.51 for the productive definition. Finally, a principal-component analysis further shows that the job quality measure using four dimensions captures four distinct components and cannot easily be reduced to fewer dimensions, see Table A7 in the appendix. Using the full set of wage workers in 40 countries with over 1.1 million observations, the four components account for 41.6%, 24.4%, 21% and 13.4% of the variation in job quality.

[27] The correlation is negative because informality is equal to 1 while the lowest job quality score is equal to 0.

5. Conclusions

This paper proposes a global measure of job quality that combines four critical dimensions, widely discussed in the literature, to characterize good quality jobs: sufficient earnings to overcome poverty, access to employment benefits, job stability, and acceptable working conditions. To develop this global measure of job quality we harmonize labor force and household surveys across 40 developing countries by identifying a common set of indicators available for each dimension. A job quality measure that values several important characteristics of employment as opposed to a single indicator such as wages or formality (widely used in the previous literature) adds value to both empirical research and policy analysis. A globally harmonized comprehensive dataset also allows to analyze quality of jobs across various countries, regions, industries, and sociodemographic groups absent in the previous studies. Finally, this study has the broadest country coverage of multi-dimensional job quality analysis based on microdata in the literature.

The results show strong positive correlation between the JQM and the share of wage employed in total employment across developing countries indicating that countries with more opportunities to find paid employment as opposed to those with large self-employed or informal workers perform better in terms of the overall job quality. Also, there is a substantial variation not only in the composite JQM across countries but in all its dimensions with greater differences observed in benefits and stability. Sectors with the highest JQM include public administration, financial and business services, and utilities, while the low-skilled sectors such as agriculture and construction have the lowest JQMs. The analysis finds that the JQM is, on average, very similar between men and women despite differences in individual dimensions. For example, the JQM decomposition reveals that women fare especially well in the working conditions dimension while men perform better in terms of income. However, the job quality is much lower for other disadvantaged groups of the population such as those living in rural areas and the youth as opposed to urban and older wage employees. Finally, the starkest difference is observed between different education groups indicating that the strongest predictors of JQM within countries is education level.

Despite these insightful results, large gaps in global data limiting the scope and coverage of job quality analysis still remain. First, most country surveys lack information on certain dimensions of job quality which have been discussed in the literature as desired characteristics of good jobs, particularly those related to work safety and professional development (lifelong learning). Second, many countries' labor and household surveys only have partial coverage of the main indicators used to produce the proposed JQM. Finally, there is insufficient information on key characteristics of good jobs for workers beyond salaried employment. Given these limitations, the paper has focused on 40 developing countries and wage employment only to produce a comprehensive measure of quality jobs. However, future research is needed to expand the list of countries as well as examine job quality for other types of employment, such as self-employed, which constitute a large share of labor in developing countries.

The vast majority of policy research work on labor markets and interventions of multilateral development agencies in developing countries has focused on employment and job creation, while less attention has been devoted to quality of employment. Many studies have applied a single dimension such as formality or labor earnings to characterize the job quality. However, since not all jobs are the same, understanding the multiple characteristics important for workers' welfare, especially those that allow individuals to move out of poverty and to the middle class in a sustained way, is a crucial policy issue to promote inclusive growth across developing countries.

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Appendix

Appendix Tables

Table A1: Countries Included in the Global JQM Analysis

Country	Country Code	Region	Survey	JQM for Wage Employees	GDP per Capita	Poverty Headcount Ratio (% of population)
Benin	BEN	SSA	2018 EHCVM	3.19	$3,506	76
Burkina Faso	BFA	SSA	2014 EMC	3.31	$2,279	77
Bangladesh	BGD	SAR	2016 LFS	2.17	$5,083	52
Bolivia	BOL	LAC	2017 SEDLAC	1.99	$8,367	8
Brazil	BRA	LAC	2017 SEDLAC	1.85	$14,836	9
Botswana	BWA	SSA	2015-16 MTHS	3.02	$16,921	37
Cote d'Ivoire	CIV	SSA	2018 EHCVM	2.99	$5,458	59
Colombia	COL	LAC	2017 SEDLAC	3.25	$14,565	13
Costa Rica	CRI	LAC	2017 SEDLAC	3.16	$21,032	3
Dominican Republic	DOM	LAC	2016 SEDLAC	3.59	$17,937	3
Ecuador	ECU	LAC	2017 SEDLAC	2.97	$10,896	10
Egypt, Arab Rep.	EGY	MNA	2018 ELMPS	3.03	$12,608	29
Georgia	GEO	ECA	2018 LFS	3.03	$14,863	15
Guinea-Bissau	GNB	SSA	2018 EHCVM	3.07	$1,949	85
Honduras	HND	LAC	2015 SEDLAC	2.17	$5,421	29
Indonesia	IDN	SAR	2016 SAKERNAS	2.50	$12,074	20
India	IND	SAR	2018 PLFS	2.68	$6,454	62
Kenya	KEN	SSA	2015-16 KIHBS	2.81	$4,452	67
Lao PDR	LAO	EAP	2017 LFS	2.37	$8,235	37
Lebanon	LBN	MNA	2018 LFHLCS	3.30	$12,289	N/A
Sri Lanka	LKA	SAR	2017 LFS	2.88	$13,225	11
Mexico	MEX	LAC	2016 SEDLAC	2.77	$18,833	7
Mali	MLI	SSA	2018 EHCVM	2.53	$2,339	80
Myanmar	MMR	EAP	2015 LFS	1.54	$4,794	15
Mongolia	MNG	EAP	2019 LFS	2.67	$12,101	5
Mozambique	MOZ	SSA	2014-15 IOF	2.41	$1,297	82
Niger	NER	SSA	2018 EHCVM	2.46	$1,263	77
Nepal	NPL	SAR	2018 PLFS	2.66	$4,009	51
Pakistan	PAK	SAR	2017 LFS	2.06	$4,877	36
Panama	PAN	LAC	2015 SEDLAC	3.07	$26,776	5
Peru	PER	LAC	2017 SEDLAC	1.93	$11,879	8
Philippines	PHL	EAP	2016 FIES-LFS	1.99	$8,390	17
Paraguay	PRY	LAC	2016 SEDLAC	1.69	$13,013	5
Rwanda	RWA	SSA	2016 EICV5	1.24	$2,214	80
Senegal	SEN	SSA	2018 EHCVM	1.84	$3,481	68
Togo	TGO	SSA	2015 QUIBB	2.49	$2,224	74
Thailand	THA	EAP	2018Q1 LFS	2.15	$18,236	0
Turkey	TUR	ECA	2017 LFS	1.66	$28,120	2
Uruguay	URY	LAC	2017 SEDLAC	1.78	$22,795	1
Vietnam	VNM	EAP	2018 LFS	2.04	$8,651	7

Notes: GDP per capita and poverty headcount ratio are taken from the World Development Indicator database. GDP per capita is measured in 2020 current USD but adjusted for purchasing power (WDI ID: NY.GDP.PCAP.PP.CD). The poverty headcount ratio is shown for the latest available year per country, using the $3.20 in 2011 USD poverty line (WDI ID: SI.POV.LMIC). Initial Job Quality index results for wage employees are based on authors' calculations.

Table A2: Availability of Statistics Indicators across Countries

Country code	INCOME	BENEFITS							STABILITY					WORKING CONDITIONS				Total # of indicators
	Earnings	Health Insurance	Unempl. Insurance	Pension	Social Security	Paid Leave	Sick Leave	# of indicators	Written contract	Permanent Employment	Formal Employment	Tenure	# or indicator	Excessive hours	Second Paid Job	Would like to work more	# of indicators	
BEN	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
BFA	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
BGD	Yes	Yes	No	Yes	No	No	Yes	3	Yes	Yes	No	No	2	Yes	Yes	Yes	3	9
BOL	Yes	Yes	No	Yes	Yes	Yes	No	4	Yes	No	Yes	Yes	3	Yes	Yes	Yes	3	11
BRA	Yes	No	No	Yes	No	No	No	1	Yes	Yes	No	Yes	3	Yes	Yes	No	2	7
BWA	Yes	Yes	No	Yes	No	Yes	Yes	4	Yes	Yes	No	Yes	3	Yes	Yes	No	2	10
CIV	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
COL	Yes	Yes	No	Yes	No	Yes	No	3	Yes	Yes	No	Yes	3	Yes	Yes	Yes	3	10
CRI	Yes	Yes	No	Yes	No	Yes	No	3	No	Yes	No	Yes	2	Yes	Yes	Yes	3	9
DOM	Yes	Yes	No	Yes	No	Yes	No	3	Yes	Yes	No	Yes	3	Yes	Yes	Yes	3	10
ECU	Yes	Yes	No	Yes	Yes	Yes	No	4	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	12
EGY	Yes	Yes	No	No	Yes	Yes	Yes	4	Yes	Yes	Yes	Yes	4	Yes	Yes	No	2	11
GEO	Yes	No	No	No	No	Yes	Yes	2	Yes	Yes	Yes	No	3	Yes	Yes	No	2	8
GNB	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
HND	Yes	Yes	No	Yes	No	Yes	No	3	Yes	Yes	No	No	2	Yes	Yes	Yes	3	9
IDN	Yes	Yes	Yes	Yes	No	Yes	Yes	5	Yes	Yes	No	Yes	3	Yes	Yes	Yes	3	12
IND	Yes	Yes	No	Yes	Yes	Yes	No	4	Yes	No	No	No	1	Yes	Yes	No	2	8
KEN	Yes	Yes	No	Yes	No	Yes	No	3	Yes	No	No	No	1	Yes	Yes	Yes	3	8
LAO	Yes	No	No	No	Yes	Yes	Yes	3	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	11
LBN	Yes	Yes	No	No	Yes	Yes	Yes	4	No	No	Yes	No	1	Yes	No	No	1	7
LKA	Yes	No	No	Yes	No	Yes	No	2	Yes	Yes	Yes	No	3	Yes	Yes	No	2	8
MEX	Yes	Yes	No	Yes	No	Yes	No	3	Yes	Yes	No	No	2	Yes	Yes	No	2	8
MLI	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
MMR	Yes	Yes	No	Yes	No	Yes	Yes	4	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	12
MNG	Yes	Yes	Yes	Yes	No	Yes	Yes	5	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	13
MOZ	Yes	No	No	No	Yes	No	No	1	No	Yes	No	No	1	Yes	No	No	1	4
NER	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
NPL	Yes	No	No	No	Yes	Yes	Yes	3	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	11
PAK	Yes	Yes	No	Yes	Yes	Yes	Yes	5	Yes	Yes	Yes	No	3	Yes	Yes	Yes	3	12
PAN	Yes	No	No	No	No	No	No	0	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	8
PER	Yes	No	No	Yes	Yes	No	No	2	Yes	Yes	No	Yes	3	Yes	Yes	Yes	3	9
PHL	Yes	No	No	No	No	No	No	0	No	Yes	No	No	1	Yes	Yes	Yes	3	5
PRY	Yes	Yes	No	Yes	No	Yes	No	3	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	11
RWA	Yes	Yes	No	No	No	No	No	1	No	Yes	No	Yes	2	Yes	Yes	No	2	6
SEN	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
TGO	Yes	No	No	No	No	Yes	Yes	2	No	No	Yes	No	1	Yes	Yes	No	2	6
THA	Yes	No	No	No	No	No	No	0	No	No	No	No	0	Yes	No	No	1	2
TUR	Yes	No	No	No	Yes	No	No	1	No	Yes	Yes	Yes	3	Yes	Yes	Yes	3	8
URY	Yes	Yes	No	Yes	Yes	No	No	3	No	No	No	Yes	1	Yes	Yes	Yes	3	8
VNM	Yes	No	No	No	Yes	No	No	1	Yes	Yes	Yes	Yes	4	Yes	Yes	Yes	3	9
Total	**40**	**20**	**2**	**20**	**13**	**29**	**19**		**24**	**26**	**23**	**20**		**40**	**37**	**21**		

Table A3: Percentage of Missing Observations for Statistics Indicators across Countries

Country code	INCOME	BENEFITS						STABILITY				WORKING CONDITIONS		
	Earnings	Health Insurance	Unempl. Insurance	Pension	Social Security	Paid Leave	Sick Leave	Written contract	Permanent Employment	Formal Employment	Tenure	Excessive hours	Second Paid Job	Would like to work more
BEN	11.1%					0.0%	0.0%			0.0%		0.0%	0.0%	
BFA	13.7%					0.0%	0.0%			0.0%		0.0%	0.0%	
BGD	0.2%	0.0%		0.0%			0.0%	0.1%	6.0%			0.0%	6.8%	6.5%
BOL	1.9%	0.3%		0.0%	0.0%	0.3%		7.6%		15.7%	0.0%	0.0%	0.0%	0.0%
BRA	0.1%			0.0%				0.0%	0.0%		0.0%	0.0%	0.0%	
BWA	2.4%	0.0%		3.2%		0.0%	0.0%	0.2%	0.0%		4.0%	0.7%	3.6%	
CIV	10.0%					0.0%	0.0%			0.0%		0.0%	0.0%	
COL	0.0%	0.0%		0.7%		0.0%		0.0%	0.2%		0.0%	0.0%	0.0%	0.0%
CRI	0.2%	7.0%		7.0%		0.6%			0.0%		3.6%	5.2%	0.0%	0.0%
DOM	0.0%	10.7%		10.7%		0.0%		15.2%	15.7%		10.8%	0.0%	0.0%	0.0%
ECU	0.1%	0.0%		0.0%	0.0%	0.0%		0.0%	0.0%	11.9%	0.0%	0.0%	0.0%	0.3%
EGY	10.9%	0.2%			0.2%	0.4%	0.4%	0.6%	0.0%	16.5%	7.2%	4.5%	5.6%	
GEO	25.7%					0.0%	0.0%	0.0%	0.2%	0.0%		0.6%	0.0%	
GNB	47.2%					0.0%	0.0%			0.0%		0.3%	0.0%	
HND	0.9%	0.0%		0.0%		0.0%		1.7%	1.7%			0.4%	0.0%	13.2%
IDN	0.0%	3.0%	7.1%	4.9%		4.3%	4.3%	4.4%	0.0%		14.4%	0.2%	0.0%	0.0%
IND	0.0%	22.0%		22.0%	22.0%	22.0%		22.0%				0.0%	0.0%	
KEN	1.1%	0.9%		0.9%		0.9%		0.9%				0.1%	0.0%	0.2%
LAO	5.4%				12.6%	8.3%	8.2%	0.0%	0.0%	23.5%	0.0%	0.0%	2.2%	0.0%
LBN	9.8%	9.3%			9.6%	10.4%	10.5%			0.0%		9.4%		
LKA	0.2%			15.5%		14.8%		15.0%	0.0%	0.0%		0.0%	1.3%	
MEX	0.2%	0.0%		0.0%		0.0%		0.0%	0.0%			0.0%	0.0%	
MLI	37.4%					0.0%	0.0%			0.0%		0.1%	0.0%	
MMR	2.8%	8.6%		7.6%		1.5%	6.4%	32.2%	35.5%	5.7%	0.2%	0.2%	0.0%	0.2%
MNG	3.3%	0.4%	0.4%	0.4%		1.6%	3.3%	0.0%	0.0%	1.4%	0.0%	0.0%	0.1%	0.0%
MOZ	1.6%				0.6%				0.0%			0.5%		
NER	8.3%					0.0%	0.0%			0.0%		0.0%	0.0%	
NPL	6.1%				0.0%	0.0%	0.0%	0.0%	0.0%	9.7%	0.0%	0.0%	0.0%	0.0%
PAK	0.6%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.0%		0.4%	0.0%	0.0%
PAN	0.0%							0.0%	0.0%	3.6%	0.2%	0.1%	0.1%	0.1%
PER	0.7%			0.0%	0.0%			1.6%	1.6%		0.0%	0.0%	0.0%	0.2%
PHL	11.3%								0.0%			0.3%	3.8%	0.0%
PRY	0.0%	0.0%		0.2%		0.3%		0.4%	0.4%	6.8%	0.2%	0.1%	0.0%	0.6%
RWA	1.0%	0.0%							0.0%		0.0%	0.0%	0.0%	
SEN	15.2%					0.1%	0.1%			0.0%		1.1%	0.0%	
TGO	8.9%					0.0%	0.0%			0.0%		0.1%	0.0%	
THA	0.7%											0.0%		
TUR	0.0%				0.0%				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
URY	0.0%	0.0%		0.0%	0.0%						0.0%	0.0%	0.0%	0.0%
VNM	0.0%				0.0%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes: No information is shown if the indicator is not available.

Table A4: Distribution of Countries by Number of Indicators Available

Number of indicators available	Income	Benefits	Stability	Working conditions
0	0	3	1	0
1	40	5	14	3
2		11	5	16
3		11	11	21
4		7	9	
5		3		
6		0		
Total # of countries	40	40	40	40

Table A5: Harmonized industry classification mapping to ISIC 4

Industry Name	**Broad Sector Name**	**ISIC 4 Categories**
Agriculture	Agriculture	A
Mining	Industry	B
Manufacturing		C
Utilities		D + E
Construction		F
Commerce	Services	G + I
Transport & Communication		H + J
Finance & Business Services		K + L + M
Public Administration		N + O + P + Q
Other Services		R + S + T + U

Notes: This table shows the aggregation of sector codes into 10 industries based on the ISIC4 sector classification.

Table A6 Correlation between Job Quality, Job Quality dimensions, and informality in SEDLAC for wage workers

	Job Quality Score	Poverty	Benefits	Stability	Working Conditions	Legal Informality	Productive Informality
Legal Informality	-0.6918	-0.2271	-0.8631	-0.447	-0.1034	1	
Productive Informality	-0.4913	-0.2207	-0.5063	-0.3781	-0.1093	0.526	1

Notes: Correlation analysis using micro data for wage workers in 12 Latin American countries for the two informality definitions as well as Job Quality and the four Job Quality dimensions. The result shows that in particular the income dimension and working conditions dimension add to the analysis of job quality, followed by the stability dimension and benefits dimension.

Table A7 Principal-component analysis of Job Quality

Component	Proportion
Comp 1	0.4160
Comp 2	0.2439
Comp 3	0.2062
Comp 4	0.1340
A principal component analysis of the four dimensions of Job Quality using over 1.1 million observations of wage workers in 40 countries shows that the job quality measure cannot easily be reduced to fewer dimensions.	

Table A8 Share of legally classified informal wage workers in SEDLAC and JQ

Share of informal workers	Share of Workers with Job Quality Levels
Informal (60%)	JQ = 0, 2.3%
	JQ = 1, 26.9%
	JQ = 2, 38.2%
	JQ = 3, 26.0%
	JQ = 4, 6.6%
Formal (4%)	JQ = 0, 0.0%
	JQ = 1, 0.1%
	JQ = 2, 3.8%
	JQ = 3, 40.3%
	JQ = 4, 55.9%
This table shows the shares of wage workers at different levels of job quality among the formal and informal workers, classified according to the productive definition of informality. A worker is informal if the firm employs five or fewer workers.	

Table A9 Adjustments and notes

General

- Surveys questions that may not promote a response. For example: *please check this box if you have a 401k retirement plan from your employer*. For questions like this, we assume non-response (or missing) indicate that the individual does not have an employer-sponsored retirement plan.
- Surveys will require certain individuals to skip questions creating missing patterns that are not truly missing. For example: *"please indicate if you have health insurance from your employer (if you are a government employee, please skip this question)"*. In this case, we assume that the government employee does receive employer-sponsored health insurance. Skip patterns are imputed with *"yes"* or *"no"* responses depending on the language written in the survey.
- Questions that include answers such as *"don't know"* are assumed missing.

Income - wages

- All wages are annualized as follows:
    - Daily payments are multiplied by 252
    - Weekly payments are multiplied by 52
    - Bi-weekly payments are multiplied by 26
    - Monthly payments are multiplied by 12
    - Quarterly payments are multiplied by 4
    - Trimester payments are multiplied by 3
    - Annual payments are left unadjusted
    - For surveys that report pay ranges, we assume the mid-point of the range is the payment amount received
- Once wages are annualized, they are divided are adjusted to 2011 CPI, translated into USD PPP, and divided by 365 to arrive at a daily income number.
- In some cases (COL, and others), cash income, bonuses, and in-kind income is not reported separately.
- Some surveys censor data at the low or high end of the income distribution. We assume censored individuals receive the level of income in which the survey is censored. (EGY censors income over 100,000 pounds; GEO censors monthly income below 100 GEL).
- A few countries reported a high number of missing values for income. For these countries (GNB, MLI and GEO), income was imputed using a Mincer equation.
- Wages in kind do not have missing values, but only 0's. This creates an inherent assumption that no one is missing wages in-kind, but they are reporting 0 wage in-kind income.

Stability - tenure

- Due survey questionnaire constraints we cannot precisely identify tenure for MNR and VNM. In these countries, he tenure indicator is constructed as follows:
    - MNR: individuals 25 years and over with two or more years of tenure receive an indicator for tenure.
    - VNM: individuals 25 years and over with five or more years of tenure receive an indicator for tenure.

Stability - formal

- Public sector employment is assumed to be formal employment. However, we are interested in measuring formal employment in non-public sector too and do not want to bias the job quality measure by size of government, so we do not include the formal indicator in a country if they do not have indicators for the private sector.
- To increase the scope throughout the SSA region, we adopt a formality definition specific to this region. Formality in BEN, BFA, CIV, GNB, MLI, NER, SEN, and TGO are based on type of

employment. Individuals that are Senior Managers, Middle Managers/Supervisors, and Skilled Worker/Employees are considered formal.

Firms that employ 5 or more people are considered formal in URY. This is a special case that follows the SEDLAC methodological guide.

Satisfaction - excessive hours worked

- Many surveys ask respondents for their *usual hours* of work per period and their *actual hours* of work per period. Our default is to use *usual hours* of work first, and supplement missing values with *actual hours*. In cases where *usual hours* are not reported and only *actual hours* are reported, then we use *actual hours*.
- There is significant bunching, across all surveys, for weekly hours of 97, 98, and 99. These reported hours are assumed to be missing.
- There are patterns in surveys that indicate misinterpretation of questions. For instance, surveys may ask respondents how many days they work per week, and how many hours per day. Some respondents report 8, 12, and 40 days per week. We assume these are missing since we are unable to calculate weekly hours. Some respondents report 40+ hours per day. We assume these cases are hours per week and we report this as their weekly hours.

Satisfaction - second paid job

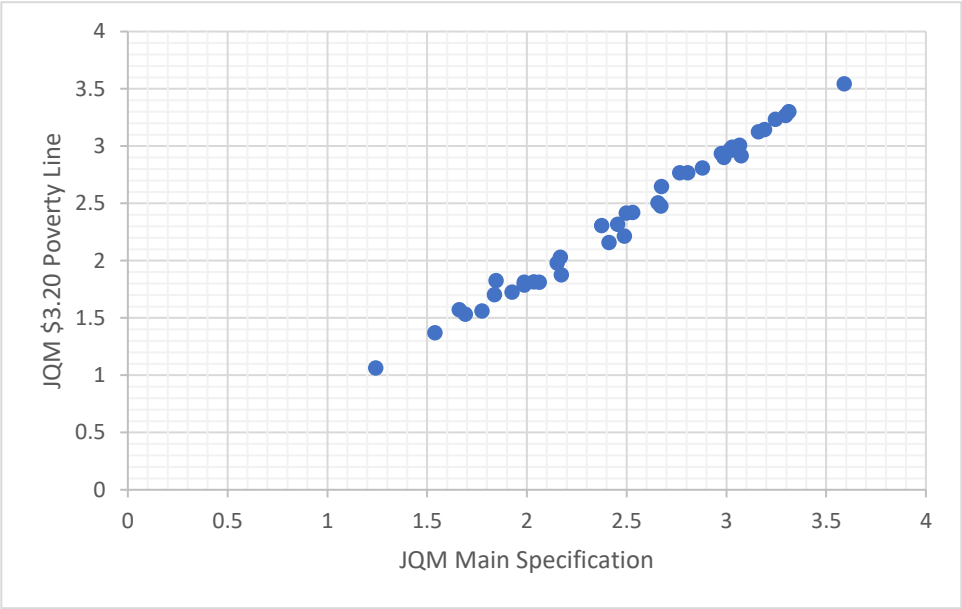
Not all surveys ask the direct question: *do you have a second paid job?*. Additional questions are used to infer whether the second job is paid. For instance, *"do you have a second job?"* may be one question, then there may be a question that asks: *"do you have secondary income?"*, we assume in this case that the secondary income comes from the second job.

Demographic variable definitions

- **Age:** age in years
- **Youth:** individuals 15 to 24 years of age
- **Male:** indicator set equal to one if an individual is male
- **Urban:** indicator set equal to one if an individual resides in an urban location
- **Ethnic:** indicator set equal to one if an individual identifies as an ethnic minority
- **Disabled:** indicator set equal to one if an individual registers as a disabled person or receives disability support from the government
- **Education years:** number of years of education
- **Education level:** completed level of education (primary, secondary, tertiary)
- **Enrolled:** indicator set equal to 1 if individual was enrolled in school at the time of the survey
- **Occupation code:** official country occupation code
- **Household size:** number of members that share the same household
- **Dependents:** number of individuals under 15, and over 64 that reside in the same household
- **Dependency ratio:** total dependents in a household divided by the total non-dependents in the same household
- **Public employment:** indicator set equal to one if an individual is employed in the public sector
- **CCODE:** three letter country abbreviation
- **Country name:** the name of the country
- **Region:** World Bank region assignment
- **IDA:** World Bank lending classification
- **Income group:** World Bank country income level classification

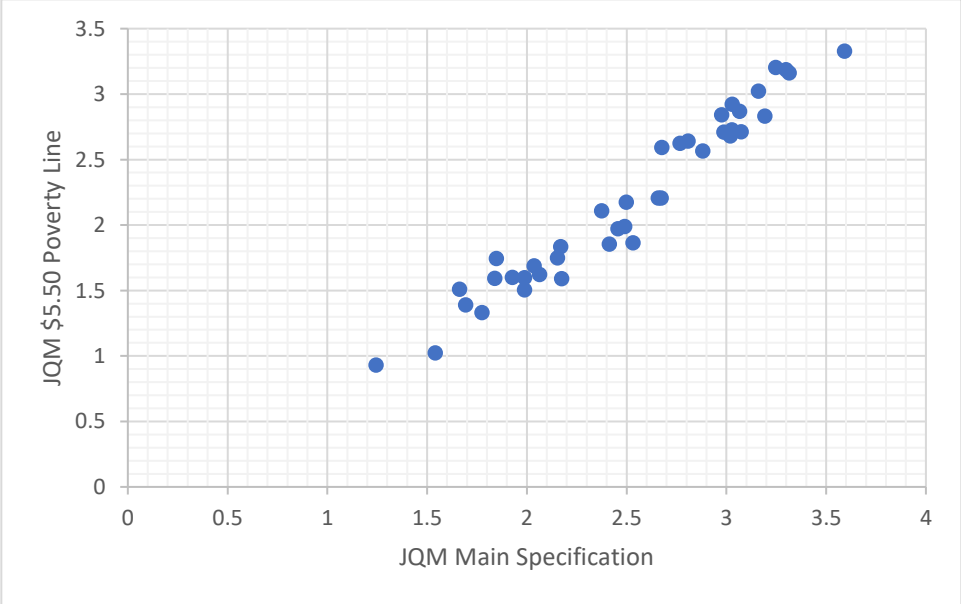
Appendix Figures

Figure A1: JQM main specification compared to JQM using $3.20 poverty line for income threshold



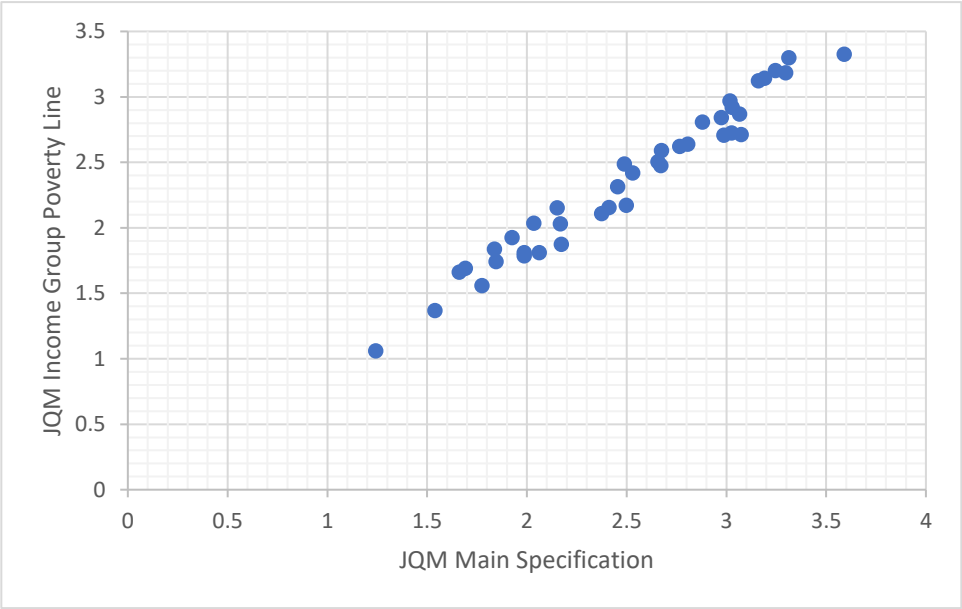
Notes: Both specifications use the 2.6 dependency ratio.

Figure A2: JQM main specification compared to JQM using $5.50 poverty line for income threshold



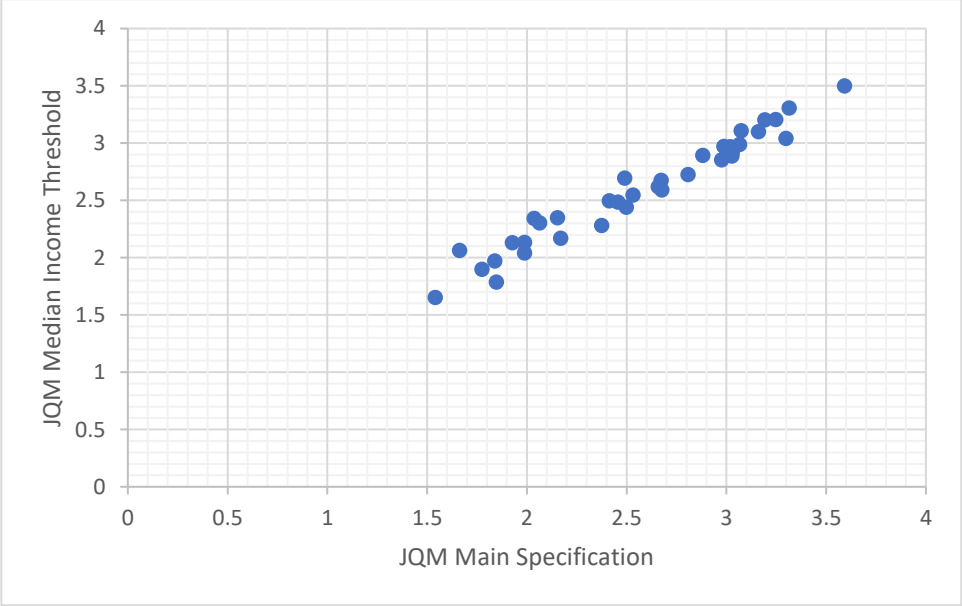
Notes: Both specifications use the 2.6 dependency ratio.

Figure A3: JQM main specification compared to JQM using flexible poverty line across income groups



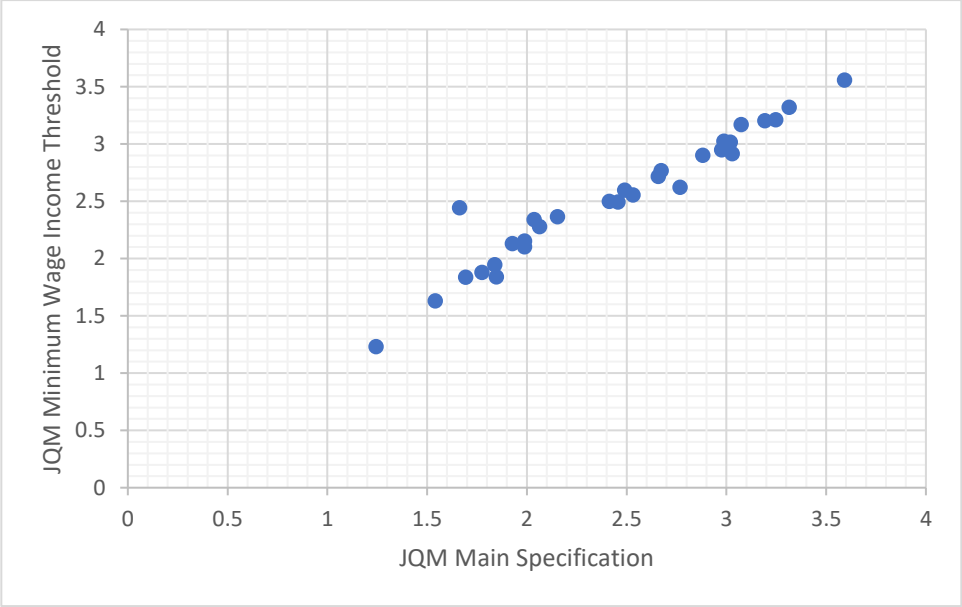
Notes: Both specifications use the 2.6 dependency ratio.

Figure A4: JQM main specification compared to JQM using median wage as income threshold



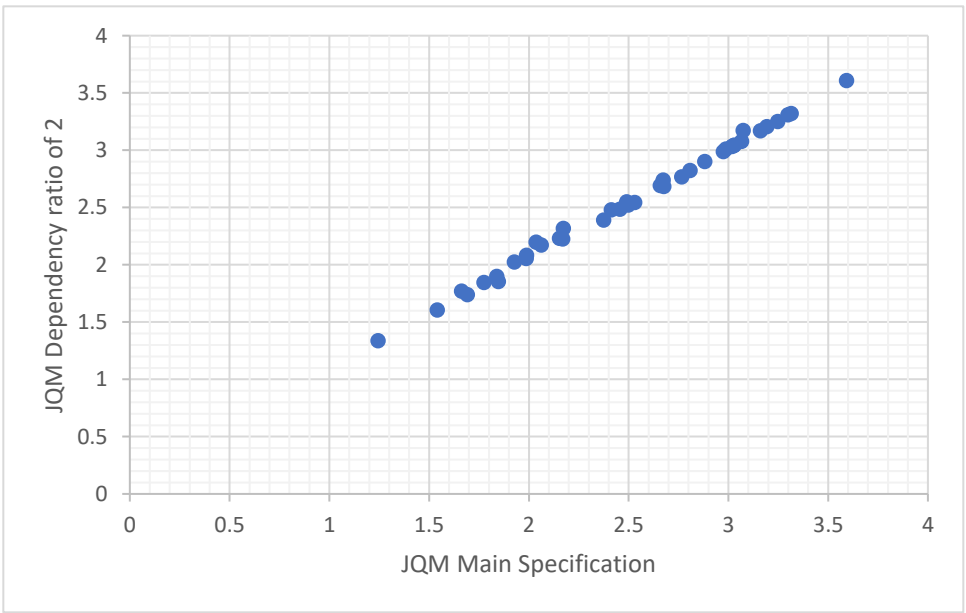
Notes: Median income by country is obtained from historical data in the Global Database of Share Prosperity from the Development Data Hub. All income levels are measured in 2011 PPP. This information is available for 36 out of the 40 countries included the job quality sample. The four excluded countries are Equatorial Guinea, Kenya, Myanmar, and Lebanon.

Figure A5: JQM main specification compared to JQM using minimum wage as income threshold



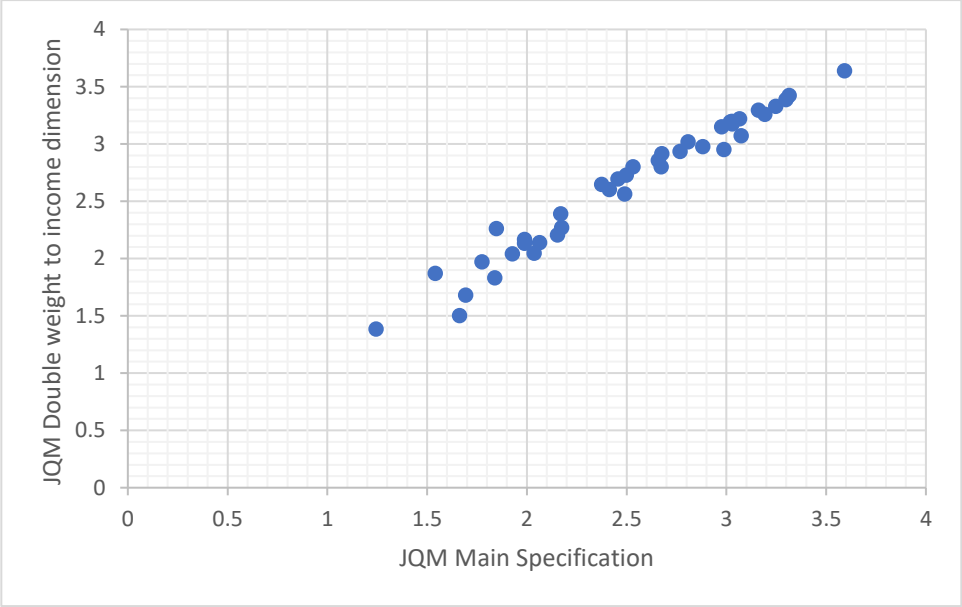
Notes: Monthly minimum wages are obtained from the International Labour Organization's statistics on wages. Monthly wages are measured in 2011 PPP and adjusted to daily wages. This information is available for 30 out of the 40 countries included the job quality sample. The ten excluded countries are Bolivia, Dominican Republic, Ecuador, Honduras, Mexico, Myanmar, Panama, Peru, Paraguay, and Uruguay.

Figure A6: JQM main specification compared to JQM with dependency ratio equal 2



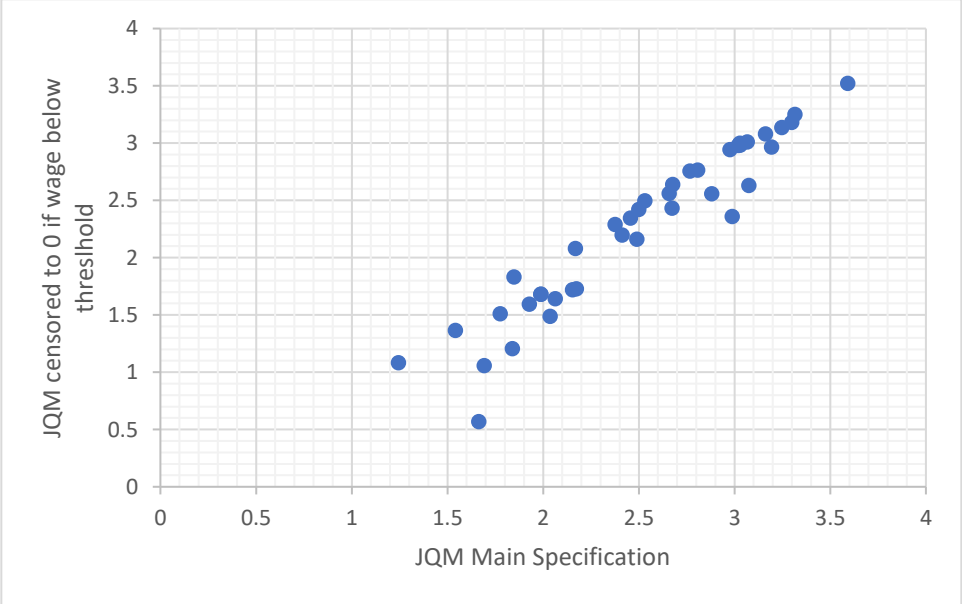
Notes: Both specifications use the $1.90 poverty line to construct the income threshold.

Figure A7: JQM main specification compared to JQM that gives double weight to income dimension



Notes: Both specifications use the $1.90 poverty line and dependency ratio of 2.6 to construct the income threshold.

Figure A8: JQM main specification compared to JQM censored if wage below threshold



Notes: Both specifications use the $1.90 poverty line and dependency ratio of 2.6 to construct the income threshold.

Figure A9: Differences of selection into wage-employment and JQM by gender