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GLOBAL WORKING HOURS

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### **ABSTRACT**

This paper uses labor force surveys from 160 countries to build a new microdatabase on hours worked covering 97% of the world population in cross section. We also construct time series spanning over 20 years in 86 countries. Hours worked per adult slightly decline with GDP per capita but are weakly correlated with development overall. Hours worked by the young (aged 15-19) and elderly (aged 60+) fall with development, driven entirely by growing school attendance and public pension coverage. Hours worked among prime-age adults (aged 20-59) are stable with development but undergo a great gender reshuffling: falling male hours per worker have been exactly offset by increases in female labor force participation in many countries. Labor income taxes are strongly negatively related to hours worked across countries. This correlation is attenuated when controlling for social spending and disappears when further controlling for working hours regulations. Both social spending and working hours regulations are associated with lower hours worked.

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A database and code used to produce the main results is available at  
<https://www.dropbox.com/scl/fo/ezcdqlpgfh4n0hhutvgxk/ANL4AmjwI-2W8vH-LTIUpU0?rlkey=zsnottclorikqd91ep2evvva9&e=2&st=8n27kfup&dl=0>

# 1. Introduction

A large literature has examined the evolution and determinants of hours worked, drawing on labor force surveys that have been carried out in many countries. Yet, to date, no study has put together all these data sources to construct truly global statistics on hours of work. The most thorough attempt to date is Bick, Fuchs-Schündeln, and Lagakos (2018), who construct cross-sectional labor statistics for 80 countries covering 41% of the world population around 2005.

**A Global Database on Hours Worked.** In this paper, we mobilize labor force surveys to build a new global database of hours worked in 160 countries covering 97% of the world population in cross section. We also construct time series spanning over 20 years in 86 countries located in all world regions. This data collection was made possible by several recent developments.

First, in terms of data access, the International Labour Organization (ILO) and the World Bank have been collecting household surveys across the world and making them as comparable as possible (see Messenger, Lee and McCann 2007 for a description of the ILO data and Montenegro and Hirn 2009 for the World Bank data). Both institutions have access to survey data that are not publicly disclosed by the countries that created them. The ILO has been willing to share its labor force survey data to help us create this global database.<sup>1</sup> World Bank data can be accessed by its researchers for academic purposes. A number of large developing countries have also begun publicly releasing—or even conducting—labor force surveys with information on hours worked, notably China and India, which together account for 35% of the world population and were not covered by Bick, Fuchs-Schündeln, and Lagakos (2018).

Second, in terms of variables for the analysis, several recent studies—many conducted as part of the World Inequality Database project—have constructed country-level socioeconomic and public policy indicators, particularly on taxation (Bachas et al. 2026) and government spending (Fisher-Post and Gethin 2025; Gethin 2025a). These datasets allow us to examine the relationship between public policies and hours worked more comprehensively than has previously been possible.

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<sup>1</sup>The ILO also shared data for Gethin’s (2025b) study on education and global poverty reduction and for Fisher-Post and Gethin’s (2025) study on government redistribution around the world.

Third, in terms of methodology, a key concern raised by Bick, Fuchs-Schündeln, and Lagakos (2018) is that surveys conducted during specific periods of the year may produce biased estimates of hours worked, for example because of seasonal variations in agricultural activity. For this reason, Bick, Fuchs-Schündeln, and Lagakos (2018) restricted their main analysis to a core sample of 49 countries (out of 80) covering 23% of the world population. Our careful investigation of seasonality using high-quality labor force surveys fielded throughout the year reveals that monthly seasonality in hours worked is modest in developing countries—and is in fact larger in richer countries due to summer holidays. This finding gives us confidence that surveys not covering the full year still provide reliable estimates of annual hours worked.

Finally, we are publishing [here](#) and plan to regularly update a publicly available database (including metadata documentation incorporated directly into the database), covering hours worked and other labor market outcomes at the country×year×age×gender level, which will allow researchers to replicate almost all the results presented in this paper and further explore the cross-country and historical determinants of hours worked around the world.

**Substantive Findings.** The analysis of our new database delivers a number of substantive findings, sometimes confirming and sometimes qualifying results from previous work. Throughout, we follow international conventions and measure weekly hours worked across all jobs contributing to GDP. We thus include unpaid agricultural work, which produces goods and hence is included in GDP, but exclude unpaid home services such as cleaning, cooking, and taking care of children or elderly family members.

First, we construct global labor statistics today, using population weights to represent the 97% of the world population covered by our surveys. 59% of the world’s adult population (aged 15+) is employed. They work 42 hours per week on average. Hence, weekly hours per adult are about 25. We unsurprisingly find that global hours worked are very strongly bell-shaped with age. Women supply 35% of (GDP-producing) hours worked, while men supply 65%. These age and gender patterns are mostly driven by differences in employment rates.

Second, turning to cross-country comparisons, we find that hours worked decline slightly with GDP but are only weakly correlated with development overall. Employment rates are

uncorrelated with development, while hours per worker are bell-shaped. Increasing hours at low levels of development are driven by structural change: hours in agriculture are moderate and flat with GDP per adult while hours in manufacturing and services are very high in middle-income countries. As a result, the unconditional elasticity of hours worked with respect to GDP is small, around -0.04 in the cross section and -0.01 in panel data, implying a reduction in hours of 5-20% over the entire development spectrum. GDP explains around 5% of cross-country variations in hours worked, and less than 1% of historical variations in hours within countries.

Third, we document significant heterogeneity in this pattern by age and gender. Hours worked by the young (aged 15-19) and the elderly (aged 60+) decline with development. In cross-country regressions, these reductions are entirely explained by rising school attendance among the young and public pension coverage among the elderly, in line with a broad body of work. In the time series, the fall in youth hours is particularly pronounced while elderly hours are stable rather than falling. This pattern is consistent with the rapid growth of schooling but limited expansion of pension systems in developing countries in recent decades.

In contrast, we find that hours worked by prime-age adults (20-59) are flat, if not slightly increasing, with GDP per adult. Female hours increase with development, while male hours decline. There is considerable heterogeneity in this pattern across countries and over time. Female hours worked are substantially lower in Muslim/Hindu-majority countries and higher in former communist countries. The fall in male hours is driven by reduced hours per worker and is quantitatively offset by rising female employment rates. This pattern suggests that the process of development tends to equalize hours worked across genders, compressing the long hours of working men while enabling more women to enter employment in GDP-generating activities.

Fourth, we explore the link between prime-age hours worked and public policies: taxes on labor, transfers, and working hours regulations. Consistent with the existing literature on richer countries, we find that labor taxes are strongly negatively correlated with hours worked both in international comparisons and in within-country time series. In contrast, GDP per capita becomes weakly positively correlated with hours worked once tax variables are controlled for, with an elasticity below 0.1. As discussed in the macroeconomics literature, a standard labor

supply model with a low uncompensated labor supply elasticity but a large compensated elasticity can rationalize these findings: Economic growth increases the wage rate (uncompensated labor supply effects) while labor taxes fund transfers (compensated labor supply effects). We do find that adding social spending (cash or quasi-cash transfers, excluding pensions) in the regression attenuates the labor tax effects, consistent with this channel, but only partially. The labor tax effects disappear once we further add a broad index of working-time regulations applying to the formal sector. Although exploratory, these results suggest that labor taxes are strongly negatively associated with hours worked not only because they are used to finance social transfers, but also because they correlate with the development of the formal sector with regulated working hours.

Together, our findings suggest that collective choices and public policies may play a powerful role in shaping the structure of hours worked. Schooling and pension systems, cultural norms on the role of women, and social policies strongly correlate with working hours and their allocation by age and gender beyond development. While economic growth often helps foster such institutions, many of them are only partially determined by it, which could explain the large cross-country variations in hours worked observed at all levels of development.

**Related Literature.** There is a large literature on hours worked across countries and over time, which we briefly describe to place our study in context.

*Cross-Country Comparisons.* As mentioned above, Bick, Fuchs-Schündeln, and Lagakos (2018) have constructed the most comprehensive cross-sectional database on hours worked. Their core sample covers 49 countries representing 23% of the world population (with an extended sample of 80 countries covering 41%). Their main finding is that hours worked decline with economic development. Other recent data collection efforts include Bridgman et al. (2018) and Gottlieb et al. (2024), who study both market and nonmarket work using time use surveys. Earlier cross-country work had mostly focused on richer countries (see for example Bick, Brüggemann, and Fuchs-Schündeln 2019) with a large literature analyzing how taxes, retirement systems,

regulations, or social norms can explain their differences.<sup>2</sup> The gender division of work has also received considerable attention (e.g., Bick, Fuchs-Schündeln, and Lagakos 2018; Bick et al. 2022). Our new database allows us to broaden the scope of the analysis to the entire world.

*Time Series.* There is also a large literature on hours worked over time, generally focused on high-income countries (e.g., Huberman 2004; Huberman and Minns 2007; Ramey and Francis 2009). Gilmore (2021) compiles historical estimates over the past two centuries for various countries. Most recently, Andreescu et al. (2025) have constructed global harmonized series on hours worked in 57 countries and world regions over 1800-2025. The key challenge is that historical data generally exist only for specific occupations rather than covering hours of work for all adults as modern labor force surveys do. One important exception is Ramey and Francis (2009) who build such series for the United States since 1900 using census and survey data. We will use their series as a comparison benchmark in our time series analysis.<sup>3</sup> The historical gender gap in hours worked has also been studied extensively especially in the United States (e.g., Goldin 1990, 1995, 2024; Dinkelman and Ngai 2022; Ngai, Olivetti, and Petrongolo 2024; Chiplunkar and Kleineberg 2025). Work on the determinants of hours worked in the time series has primarily focused on richer countries and the role of income and substitution effects on labor supply (e.g., McGrattan and Rogerson 2004; Ohanian, Raffo, and Rogerson 2008; Boppart and Krusell 2020). Our new database allows us to study long-run trends in hours worked and their determinants in 86 countries across all levels of development.

The paper is organized as follows. Section 2 describes the construction of the database. Section 3 analyzes global working hours. Section 4 studies cross-country variations in hours worked. We turn to time series evidence in Section 5. Section 6 analyzes the role of taxes, social spending, and working hours regulations. Section 7 concludes.

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<sup>2</sup>On taxes, see Prescott (2004), McDaniel (2011), and Bick and Fuchs-Schündeln (2018). On government spending, see Rogerson (2006, 2007). On retirement programs, see Gruber and Wise (1999), Erosa, Fuster, and Kamburov (2012), and Wallenius (2013). On working regulations, see Botero et al. (2004), Messenger, Lee and McCann (2007), and Causa (2008). On social norms and institutions, see Alesina, Glaeser, and Sacerdote (2005). See also Breza and Kaur (2025) for a broader review on labor markets in developing countries.

<sup>3</sup>Ngai, Olivetti, and Petrongolo (2024) provide even longer time series for the United States but no age breakdown, which is why we use the Ramey and Francis (2009) series.

## 2. A New Database on Global Hours Worked

This section describes the construction of our database on global hours worked. Section 2.1 covers data sources. Section 2.2 describes the data harmonization procedure. Section 2.3 presents descriptive statistics on the coverage of our database. Section 2.4 discusses potential biases related to seasonality in hours worked.

### 2.1. Data Sources

We start from a total of about 5,000 nationally representative household surveys. These surveys have typically been fielded by national statistical institutes and provide individual-level information on hours worked. We gather this unique set of household survey microdata by combining six groups of sources.

**1) ILO Database.** Our first source is the International Labour Organization’s Microdata Repository. The ILO maintains the largest and most comprehensive collection of labor statistics. Based on extensive data collection efforts and in collaboration with national statistical institutes, ILOSTAT has harmonized a large number of household surveys covering nearly all countries in the world. Using ILOSTAT’s on-demand data query service, we extracted output on actual and usual hours worked from approximately 1,800 surveys conducted in 150 countries since 1990.<sup>4</sup> The database provides information on hours worked, along with other key labor market and sociodemographic variables. About two-thirds of the surveys are labor force surveys. The remainder are multi-purpose surveys that include labor market data alongside broader information on households’ economic conditions.

**2) I2D2 Database.** I2D2 is a microdatabase maintained by the World Bank. Thanks to an extensive data harmonization effort similar to that of the ILO, the World Bank has assembled a large number of household surveys covering almost all countries in the world. The majority

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<sup>4</sup>The ILO also publishes tabulations on actual hours worked using this database, as well as modeled estimates covering almost all countries: see <https://ilostat.ilo.org>. More information on the microdata and harmonization methods is available at <https://www.ilo.org/publications/ilostat-microdata-processing-quick-guide-principles-and-methods-underlying>.

are living standard surveys primarily focused on income and expenditure. However, about 850 include a detailed labor module, allowing us to observe employment and hours worked.

**3) Global Monitoring Database.** I2D2 was discontinued in 2017 and was replaced by the Global Monitoring Database (GMD). The primary focus of the GMD is to measure the distribution of household income and consumption. However, about 150 surveys, mostly covering recent years, also record information on hours worked as in the I2D2 database.

**4) Global Labor Database.** The Global Labor Database (GLD) is another data harmonization project recently launched by the World Bank. The objective of the GLD is to compile labor force surveys, with a particular focus on developing countries. At the time of writing, it contained about 350 surveys covering 28 countries.

**5) EU-LFS.** The European Union Labour Force Survey is a collection of harmonized labor force surveys maintained by Eurostat. The EU-LFS brings together almost 1,000 surveys fielded in 31 European Union countries, some of which go back to the 1980s. While the EU-LFS is also available in the ILO database, we use the microfiles provided by Eurostat to conduct additional analyses related to holidays and seasonal variations in hours worked.

**6) Other Data Sources.** We complement these five databases with additional surveys from various sources. The Luxembourg Income Study assembles household surveys covering mostly rich countries. IPUMS International contains census sample microdata, some of which have recorded information on hours worked. The Life in Transition Survey allows us to cover a few additional countries in Eastern Europe and Central Asia. Finally, we downloaded and harmonized 140 additional surveys from country-specific data portals and other sources, allowing us to further expand the coverage of our database.

## 2.2. Harmonization

**Data Harmonization.** Starting from these databases, we select and link sources to construct a single harmonized database on global hours worked. We proceed in two steps.

First, we remove surveys with incomplete coverage or inconsistent information on hours worked, such as surveys that only asked about hours for a subsample of the adult population. Most importantly, the 19th International Conference of Labour Statisticians in 2013 led to the adoption of a resolution that restricts the definition of employment to work performed for others in exchange for pay or profit. This revision implies that own consumption work (such as subsistence agriculture) is not counted as employment in recent surveys adopting this definition, despite the fact that such good-producing work contributes to GDP and is quantitatively large in the poorest countries. We systematically remove from our database surveys fielded in low-income countries that rely solely on this new definition (see Appendix Table C2), ensuring that our statistics on hours worked consistently cover unpaid agricultural work in these countries.

Second, we select one survey per country-year. Indeed, some surveys are duplicated across the sources outlined above. In some cases, countries have also fielded several surveys covering work hours in the same year. We give priority to labor force surveys over other types of surveys. Given their particular effort at harmonizing labor market statistics, we also generally prioritize the ILO and GLD over other sources. For the latest year, we have labor force surveys for 108 countries and other surveys with detailed labor modules for 52 (see Appendix Table C1).

As an illustration, Appendix Figure C1 depicts time series of hours per adult and hours per worker in four countries (Greece, Mexico, the Philippines, and Pakistan) across available sources, together with the series we selected from them. Appendix Figure C2 compares our estimates of hours worked with those from the Penn World Tables. The two measures are positively correlated, although they differ substantially for many countries.<sup>5</sup>

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<sup>5</sup>The PWT source hours worked from the Conference Board Total Economy database, which does not report country-specific metadata information. As discussed in Bick, Fuchs-Schündeln, and Lagakos (2018, Appendix A.4), there is a concern that many data points might be interpolated or extrapolated.

**Definition of Hours Worked.** Nearly all surveys follow the definition of hours worked in the framework of the National Income and Product Accounts. Hours worked include paid employment and unpaid work used in the production of output included in GDP, regardless of whether that output is sold or used for own consumption. Hours spent on activities that are not recorded as output in the national accounts are excluded, namely service work that is not paid such as cooking, cleaning, or childcare and elderly care within the household.

About 85% of surveys in our database and 126 countries in the last year available ask all household members aged 15 or above about actual hours worked in the past week at all jobs. In other cases, we rely on usual hours worked or hours worked at the main job. In our online publicly available database, we report detailed information on the name of each survey, how the questions on employment and hours worked were asked, and additional metadata information. Appendix C provides a longer discussion and empirical analysis of measurement comparability issues. For instance, we document that usual hours are on average 6% higher than actual hours, while hours worked at all jobs are 2% higher than hours worked at the main job. Because of the small quantitative magnitude of these conceptual discrepancies, our main results on hours worked over the course of development are insensitive to accounting for them.

**Variables of Interest.** In addition to hours worked, we collected information on other sociodemographic variables. Our harmonized database covers age in five-year bins, gender, school attendance, educational attainment, sector of employment, occupation, and earnings for both wage earners and the self-employed. Almost all surveys also provide information on the composition of the household.

### **2.3. Data Coverage**

Appendix Figure [A1](#) depicts all the countries for which recent survey data are available for our analysis as well as the regional breakdown that we will use. Relative to the usual partition of countries by region, the Middle East and North Africa region is expanded to include Saharan/Sahel countries (Chad, Niger, Mali, Mauritania), which are majority-Muslim and similar

to North African countries in their hours worked patterns. Our data cover 97% of the world population. The missing 3% mostly consist of countries in the Middle East and North Africa, where surveys covering working hours either have never been fielded or have not been made available to either researchers or the World Bank or the ILO.

The microdata cover a total of about 470 million individuals surveyed in 160 countries (see Appendix Table A1). Some countries in Western Europe, the Anglosphere, Latin America, and Asia have data going back as early as the 1970s-1980s. We have less historical depth in the Middle East and Africa, although several countries do have surveys going back to the 1990s. All in all, our final database assembles about 2,600 surveys, allowing us to cover both the worldwide distribution of work hours today and high-quality time series spanning several decades in 86 countries. It also covers shorter time series in almost all countries.

Appendix Table A2 provides further information on the sources used in our final database. We stress the substantial complementarity between the six sets of sources available to measure working hours. For instance, the ILO microdatabase has the greatest coverage of high-quality labor force surveys, but little historical depth in comparison to I2D2 and the GLD. Other data sources, such as the Luxembourg Income Study and country-specific surveys, are essential to further expand coverage. With this combination of sources, we believe that our microdatabase covers almost every labor force survey ever fielded in the world that still has a usable microfile.

## 2.4. Seasonality

An important source of concern, previously highlighted in the literature, relates to survey representativeness over the calendar year (Bick, Fuchs-Schündeln, and Lagakos, 2018; Bick, Brüggemann, and Fuchs-Schündeln 2019). If a survey is fielded over a short period of time, it might not be representative of annual hours worked. Two sources of bias are particularly concerning. First, surveys might be under- or over-sampling holidays, which can introduce significant bias especially in high-income countries. Second, surveys may only cover specific times of the agricultural calendar, leading to a misrepresentation of annual hours worked in countries with large agricultural sectors.

The time coverage of surveys in our database varies substantially. Some were conducted over a few months, while others were deliberately fielded throughout the year to account for seasonal fluctuations. Fortunately, the quarter of interview is available in many high-quality surveys, allowing us to directly investigate seasonality and the extent to which it may bias our measures of hours worked.

Appendix Figure C3, panel (a) shows that hours worked in Western Europe are generally lower in the third quarter, corresponding to the summer holidays. However, seasonality is much less pronounced in developing countries (Appendix Figure C3, panel (b)). In both Western Europe and developing countries, cross-country variations in hours worked are similar across quarters. Hence, using data from a given quarter has very limited impact on estimates of which countries have the highest and lowest hours.<sup>6</sup>

In Appendix Figure C4, we plot the correlation between measured hours worked across quarters in panel (a), as well as the distribution of quarterly deviations from annual averages across all 224 surveys with available data in panel (b). In the vast majority of surveys, the gap between hours worked in any quarter and the annual average is very small, falling below 5%.<sup>7</sup>

We also investigate the implications of downward-adjusting hours worked to make them consistent with legal paid annual leave in each country, following Bick, Brüggemann, and Fuchs-Schündeln (2019). This adjustment slightly reduces estimates of hours worked in rich countries but leaves the broad picture unchanged (see Appendix Figure C4, panel (c)). These results provide reassuring evidence that seasonality and misreporting of holidays are unlikely to significantly bias our estimates of hours worked and how they vary across countries and over time.

### 3. Global Hours Worked

We start by documenting key facts on worldwide hours worked by age and gender that will provide guidance for our subsequent cross-country analysis. Table 1 reports global weekly

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<sup>6</sup>Appendix Figure C5 shows that hours worked by the young (aged 15-19) increase in the third quarter in Western Europe (teenage summer jobs) but display limited seasonality in developing countries.

<sup>7</sup>These findings do not rule out the possibility of significant seasonality across weeks within a given month or quarter (see, e.g., Frazis and Stewart 2004, 2009). However, nearly all our surveys are fielded over at least a full quarter, so that weekly fluctuations are accounted for.

hours worked statistics by gender and broad age group for all adults (aged 15+) in our data representing 97% of the world population for the most recent year (generally 2022-2023 or 2019, see Appendix Table C1; we exclude the years 2020-2021, which are affected by COVID). Estimates are weighted by adult population size in each country to be representative of the world population we cover.

Worldwide, adults aged 15 and above work 24.5 hours per week on average in jobs contributing to GDP. Men work 31.7 hours while women work 17.4 hours. Hence, women's hours worked are only 55% of men's hours worked: they provide 35% of GDP-producing global hours worked while men provide 65%. Most of this gender gap is explained by the extensive margin: only 48% of women are employed compared to 71% of men, so that the female employment rate is 67% of the male employment rate. Conditional on employment, women work 37 hours, which is 83% of the 45 hours worked by employed men.

Table 1 also shows that hours worked are much lower for the young, defined throughout our paper as those aged 15 to 19, and the elderly, defined as those aged 60 and older. The young work only 7.6 hours per week on average because only 23% of them are employed. Symmetrically, the elderly work only 11 hours because only 31% of them are employed. Prime-age adults, defined as those aged 20 to 59, work on average 43 hours conditional on being employed and 72% of them are employed, so that hours per prime-age adult are 31 on average. Conditional on being employed, both the young and elderly work about 35 hours, almost as much as the prime-age.

Figure 1 depicts global average weekly hours worked per adult (aged 15 and above) in panel (a), adult employment rates in panel (b), and weekly hours worked per worker in panel (c) by gender and five-year age bins: 15-19, 20-24, ..., 60-64, and grouping together those aged 65+. As is well known (e.g., Blundell, Bozio, and Laroque 2013; Bick, Fuchs-Schündeln, and Lagakos 2018), hours worked are strongly bell-shaped with age: they first increase sharply, then are relatively stable from age 25 to 54, and finally decline rapidly at older ages. This bell shape is present for both men and women separately and is driven almost entirely by the employment rate extensive margin depicted in panel (b). Over 90% of middle-aged men (aged 30-49) work, while less than 30% of young (aged 15-19) and elderly (aged 65+) men do. Women's employment

rates peak at about 65%. In contrast, the bell shape with age is much attenuated for hours of work conditional on working, as depicted in panel (c): young and elderly workers' hours are only slightly less than prime-age workers'. This distinct pattern of work by age and gender will guide our cross-country analysis in Section 4 and time series analysis in Section 5. As we shall see, education and pension policies shape young and elderly hours while cultural norms and development shape the gender divide.

Panel (d) depicts the global density distribution of hours worked among workers. There are spikes in hours of work, generally corresponding to social norms or regulations about normal hours per day and the normal number of days off each week. While some of these spikes could partly reflect survey respondents' tendency to report round numbers (e.g., Gideon, Helppie-McFall, and Hsu 2017), potentially explaining increases at 30 or 50 hours, the magnitude of spikes around typical workweeks is striking. About 11.5% of the world employed population reports working exactly 40 hours per week (generally 8 hours for 5 days a week), while almost 2% of the employed did not work in the past week due to vacations, sickness, or other reasons. These spikes motivate our analysis of the role of working hours regulations in Section 6.

## 4. Cross-Country Variations in Hours Worked

We now disaggregate the data by country to study cross-country variations in hours worked and their relationship with economic development. Section 4.1 focuses on total hours worked among all adults over the course of development. Industry disaggregations analyzed in Section 4.2 help understand variations in hours per worker. Age and gender disaggregations, analyzed in Sections 4.3 and 4.4, help understand variations in employment rates. To be representative of the full world population as in Section 3, we weight estimates by population size in our benchmark analysis. In Section 4.5, we explore the sensitivity of our results to weighting by population and connect with the pioneering work by Bick, Fuchs-Schündeln, and Lagakos (2018), which presented unweighted cross-country estimates.

## 4.1. Hours Worked Over the Course of Development

Figure 2 depicts average weekly hours worked per adult (aged 15+) against log GDP per adult in 2023 PPP USD in panel (a), decomposed into the employment rate in panel (b) and hours per worker in panel (c). Each country is shown as a circle whose area is proportional to its adult population. Colors denote world regions, as in Appendix Figure A1, and country names are reported for the largest countries (adult population above 50 million). This representation illustrates well the heavy weight of China and India, which together account for about 35% of the world population, in global hours worked. In all figures, we depict the best quadratic fit (weighted by adult population), which can illustrate non-monotonic patterns.

Panel (a) shows that hours per adult are very weakly correlated with GDP per adult.<sup>8</sup> They are slightly bell-shaped but the R-squared of the corresponding regression is only 13% (see Appendix Table A3), reflecting considerable heterogeneity in hours worked even conditioning on economic development. Hours per adult in some Sub-Saharan African countries such as Burundi and Madagascar are almost twice as high as comparably poor countries such as Afghanistan or Yemen. Table 2, Panel A summarizes our cross-country findings by providing results of a cross-sectional regression of log hours on log GDP per adult. The first column for all adults (aged 15+) shows an elasticity of -0.04, which is insignificant.

Panel (b) shows that the employment rate is broadly stable with development, while panel (c) shows that hours per worker follow a bell-shaped pattern, with a clear and marked decline among higher-income countries. As a simple illustration, employment rates are similar in China and Germany, but hours worked per adult are 50% higher in China. Conditional on GDP per adult, heterogeneity is more pronounced in employment rates than in hours per worker, reflecting large gender differences as we shall see below.

With our microdata, we can also study the variance of hours of work among workers within each country. Figure 3 depicts the standard deviation of weekly hours per worker in panel (a), and the 10th and 90th percentiles (P10 and P90) of weekly hours per worker in panel (b) against GDP per adult. Panel (a) shows a clear decline in the standard deviation of working hours with

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<sup>8</sup>Appendix Figure A3 shows an almost identical pattern when using GDP per worker or GDP per hour instead of GDP per adult.

development. Panel (b) shows a decline of long hours (90th percentile of hours worked) with GDP per adult and a slight bell shape of short hours (10th percentile) with development. Hence, hours worked become more uniform at higher levels of development. Very long hours, such as 60 hours or more, are very uncommon in high-income countries. For example, in rich countries such as the United States, France, and Germany, only about 10% of workers work more than 50 hours per week, whereas in most poor countries at least 10% of workers work more than 60 hours per week. This growing uniformity and disappearance of long hours is consistent with the rise of formal employment and working hours regulations, which correlates with the decline in hours with development as we show in Section 6.<sup>9</sup>

## 4.2. Industry

To better understand the bell shape of hours worked conditional on being employed with development, it is useful to further decompose hours per worker by industry. Figure 4 depicts average weekly hours of work per worker by industry against log GDP per adult. We divide workers into four broad industry groups: (a) agriculture, (b) manufacturing, (c) market services, and (d) government/education/health services. The last category mostly consists of government workers but also includes workers in education and health in the private sector.

Agriculture stands out with a stable pattern of hours per worker by development status. Agricultural workers tend to work 40 hours per week on average in low-, middle-, and high-income countries. By contrast, the three other industry groups show a bell-shaped pattern: hours per worker first increase and then fall with development. The fall is larger than the increase, especially for services. In middle-income countries, hours of work in manufacturing and especially market services are very high at around 50 hours per week, much higher than in the agricultural sector. This pattern is consistent with the very long hours of industrial work prevailing in the early stages of industrialization in the late 19th and early 20th centuries, which then came down as regulations on overtime work were introduced (see Gilmore 2021 and

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<sup>9</sup>Appendix Figure A4 shows that variations in hours worked by education level play at best a modest role. Higher-educated workers tend to work slightly longer hours than lower-educated workers, especially in low-income and lower-middle-income countries. However, the opposite is true in some countries, such as China, Russia, and Italy.

Andreescu et al. 2025). Working hours in government/education/health services are somewhat lower than in market services in most countries, as governments typically set lower working hour standards for government workers relative to private sector workers.

The bell shape of hours per worker with GDP per adult can be understood as follows. Hours per worker are around 40 in poor countries, where agriculture dominates with typically low hours (see Appendix Figure A5 for the fraction of workers in each sector across countries). As countries develop, the share of workers in manufacturing and private services grows; these sectors tend to have substantially longer hours than in agriculture, creating the rising pattern at low levels of development. At higher levels of development, hours worked in manufacturing and private services decline, while the share of workers in government, education, and health services—who tend to work fewer hours—continues to grow. We show that this decline correlates with the development of taxes, the social state, and working hours regulations in Section 6.<sup>10</sup>

### 4.3. Age

As we showed in Section 3, the young and elderly work substantially less than the prime-age. Figure 5 depicts average weekly hours of work per adult separately for prime-age adults (aged 20-59) in panel (a), for the young (aged 15-19) in panel (b), and for the elderly (aged 60+) in panel (c) against log GDP per adult. The decomposition into employment rates and hours per worker is provided in Appendix Figures A6, A7, and A8.

Panel (a) shows that prime-age hours of work are relatively stable with GDP per adult overall but slightly increase in the first phase of development. Lower hours among very poor countries are mostly driven by Asian, Middle-Eastern, and Sahelian countries such as Afghanistan, Sudan, and Yemen depicted in brown on the figure. Very poor Sub-Saharan African countries tend to have higher hours. Table 2, Panel A shows no correlation between log hours worked among prime-age adults and log GDP per adult (column 4).

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<sup>10</sup>This pattern is also consistent with Bick et al.’s (2022) model of structural change in labor supply along the development spectrum, in which a self-employment sector with low fixed costs (e.g., agriculture) shrinks over time as the modern wage-employment sector with high initial fixed costs and long hours absorbs an increasing share of workers. Appendix Figure A4(b) documents that within countries, hours worked tend to be *higher* in the formal sector, most likely because informality correlates with agricultural employment, which tends to display lower hours than other sectors as we saw earlier.

Panel (b) shows a notable decline in hours worked by the young (aged 15-19) with development. Panel (c) shows an even stronger decline in hours worked by the elderly (aged 60+). Table 2, Panel A, columns 2 and 3 show the quantitative magnitudes. We estimate large negative elasticities of youth and elderly hours, around -0.3. However, it is again important to note the great heterogeneity across countries particularly among the young and the elderly. The elderly and the young work long hours in many Sub-Saharan African countries but little in several poor Muslim countries such as Sudan or Yemen. GDP per adult only explains 20-30% of variations in young and elderly hours worked, as the adjusted R-squared in Table 2 shows.<sup>11</sup>

**Schooling and Hours Worked by the Young.** Educational attainment increases with development, implying that young adults are more likely to attend school in richer countries and hence have less time available for work. Figure 6, panel (a) shows that there is a strong negative correlation between school attendance and hours worked by the young. For example, in Russia, about 90% of the young aged 15-19 attend school and they work only 2 hours per week on average. In contrast, in Pakistan only 52% of the young attend school and they work 12 hours on average.

Table 3 reports results from cross-country regressions of the log of average hours of work of the young on various determinants. Estimates are weighted by adult population size in each country to be representative. The sample includes 149 countries for which the indicators we consider are available. It covers 92% of the world adult population. Log hours worked by the young are negatively correlated with log GDP per adult (column 1). School attendance of the young is the strongest correlate of their hours worked (columns 2-4). A one percentage point increase in school attendance is associated with a reduction in hours of work of 3.9%. When including school attendance, the coefficient on log GDP per adult becomes close to zero and non-significant (column 3). In other words, school attendance is strongly associated with hours worked by the young, and this association is only partly explained by the fact that school attendance is more prevalent in richer countries. Comparing the  $R^2$  across columns (1) and (2),

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<sup>11</sup>Appendix Figure A9 compares actual hours of the elderly to hours of the elderly when reweighting the data to match the U.S. demographic structure. Reweighting has only a modest impact on elderly hours.

GDP can account for about 23% of variations in hours worked by the young, while schooling can account for 61%, leaving at least  $0.61 - 0.23 = 38\%$  of variations explained by schooling through other channels than development.

Finally, column 4 shows that a higher agricultural employment share correlates with larger hours of work of the young (even when all the other variables are included). This pattern is consistent with a broad body of work (e.g., Hindman 2014) showing that children and young adults are likely to work in family businesses, which are prevalent in agriculture. With sectoral composition and school attendance variables, hours of the young become positively related to GDP per adult (column 4). Together, these findings suggest that the decline in hours worked by the young with development is mediated entirely by substitution toward education and shifts in the sectoral structure, consistent with the large literature on child labor emphasizing the role of education in preventing it (see, e.g., Basu 1999 for a survey).

**Public Pensions and Hours Worked by the Elderly.** Panel (b) of Figure 6 depicts the correlation between pension coverage (defined as the fraction of adults aged 60 and above living in a household where at least one person receives a public pension) and hours of work of the elderly (aged 60+).<sup>12</sup> The figure shows a strong negative correlation between public pension coverage and hours of work of the elderly across countries, consistent with a key role of pensions in reducing elderly hours. Poor countries in Sub-Saharan Africa and South Asia have minimal pension coverage and high hours of work among the elderly. Western European countries as well as Brazil and Russia have high pension coverage and low hours of work among the elderly.

Table 4 reports results from cross-country regressions of the log of hours worked by adults aged 60+ on various determinants. Estimates are weighted by adult population size. The sample includes 92 countries for which the determinants we consider are available. It covers 78% of

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<sup>12</sup>We construct this measure of public pension coverage by combining data from six sources: the World Bank’s ASPIRE database for most developing countries, the EU statistics on income and living conditions for European Union countries, the CPS for the United States, the IHDS for India, the CHARLS for China (Giles et al. 2023), and other country-specific surveys for several Latin American countries. When possible, we exclude very small pensions (below 10% of GDP per adult) to avoid artificially high pension coverage in countries with minimalist but widespread social pensions, such as rural China and Thailand. As a result, pension coverage is much lower in China, India, and several developing countries than if we included all forms of pensions received. Most ASPIRE surveys only report pension receipt at the household level, which is why we cannot construct a measure of individual pension coverage.

the world adult population. Column 1 shows that hours worked by the elderly are negatively correlated with log GDP per adult with a coefficient similar to the regression in Table 2, column 3 for our complete sample of 160 countries. Column 2 shows that public pension spending as a fraction of GDP and public pension coverage are also strongly negatively related to elderly work when including the size of the elderly population in the regression. Comparing the  $R^2$  across columns (1) and (2), GDP can account for about 42% of variations in hours worked by the elderly, while pension spending and coverage alone can account for 72%, of which at least  $0.72 - 0.42 = 30\%$  go beyond GDP. One additional percentage point of GDP in public pension spending is associated with a 7% reduction in elderly hours. Adding one point of public pension coverage reduces elderly hours by 0.7%. Pension spending and pension coverage fully explain the negative relationship of elderly hours with GDP (column 3).

Column 4 further adds sector composition. The size of the manufacturing workforce is also negatively correlated with elderly hours. This result could reflect the physically demanding nature of manufacturing employment, as well as the tendency of manufacturing to be organized in large, unionized firms that can offer pensions prior to the development of public pension systems.

Therefore, while the elderly work less in richer societies, this relationship is entirely mediated by the development of pensions. As we shall see in our time series analysis below, pension development is also not an inevitable consequence of economic development: in recent decades, economic growth has not been associated with reductions in elderly labor supply. These findings are consistent with the large literature that identifies pension policy as a key causal driver of elderly work (e.g., Gruber and Wise 1999; Blundell, French, and Tetlow 2017).

#### 4.4. Gender

Figure 7 depicts hours worked per adult against GDP per adult for prime-age men in panel (a) and prime-age women in panel (b). The decomposition into employment rates and hours per worker is provided in Appendix Figures A10 and A11.

Hours worked by prime-age men are bell-shaped with development. Men in middle-income

countries work substantially more (over 40 hours a week) than in low-income countries (around 35 hours a week) and especially high-income countries (about 30 hours a week). As we saw, this result is driven by the intensive margin as the employment rate of prime-age men is very high in most countries. The bell shape can be explained by sectoral change over the course of development.

In panel (b) focusing on women, we group countries into three groups most relevant for female hours worked: former communist countries in red, Muslim/Hindu-majority countries in green, and other countries in blue. Panel (b) shows a fairly strong increase in female hours of work with development on average but with substantial heterogeneity across countries. Hours worked by women are particularly low in Muslim/Hindu countries. Almost all countries where prime-age women work less than 15 hours belong to this category (the only three exceptions are the tiny countries of Kiribati, Samoa, and Swaziland). Within Muslim countries, how much women work is more closely related to social norms and women's rights rather than development. Women work as little in the middle-income countries of Egypt and Iran as in the very low-income countries of Afghanistan and Sudan (Saudi Arabia and Kuwait, which are high-income and Muslim, could not be included in our database unfortunately). Indonesia, the largest Muslim country by population, is comparable to Iran in GDP per adult but has much higher female hours (22 versus 5). Conversely, hours worked by prime-age women tend to be high in former communist countries (in red), reflecting the legacy of communist systems that often required men and women to work the same hours. Other countries (in blue) generally lie in between and do not display a clear trend with economic development.

These results contrast with the literature emphasizing the role of structural change in generating a U-shaped pattern of prime-age female employment-to-population ratios over the course of development, both across countries and in U.S. time series (Goldin 1995, 2024; Ngai, Olivetti, and Petrongolo 2024). To better investigate this issue, it is useful to decompose our results into extensive and intensive margins, as well as to restrict the sample to non-Muslim/Hindu countries. As shown in Appendix Figure A12, we do find a mild U-shaped pattern of female employment with development when excluding Muslim/Hindu-majority countries, but also a

pronounced bell-shape pattern of female hours conditional on being employed. As a result, total hours worked by prime-age women are weakly bell-shaped but uncorrelated with development overall. Appendix Figure A13 extends this analysis to female-to-male ratios in hours worked, with similar conclusions. Hence, accounting for the intensive margin offsets the U-shaped pattern of employment rates and yields an overall stability of total female hours worked over the development spectrum when excluding Muslim/Hindu-majority countries.

To get a more quantitative evaluation, Table 5 reports results from cross-country regressions of average unconditional hours of work of prime-age women on various determinants. Estimates are weighted by adult population size. The sample includes 134 countries (89% of the world population) for which all variables are available, so that the different columns are directly comparable. Consistent with Table 2, column (8), column (1) shows a positive relationship between female prime-age hours and log GDP per adult. The Muslim/Hindu population share displays a very strong negative relationship with female hours. A one-percentage-point increase in the Muslim/Hindu share is associated with a 0.6% reduction in female hours. Being a former communist country is associated with an increase in working hours of 0.2 log units. The fraction of prime-age women living with young children aged 0-5 correlates negatively with prime-age female hours of work, but the coefficient is not statistically significant. The adjusted R-squared associated with including only these three variables is a remarkable 61%, compared to 16% when only including GDP per adult. The large coefficients on Muslim/Hindu shares and former communist status hardly change when adding controls (columns 3-4). When combining these three variables with log GDP per adult, the correlation of hours with GDP becomes close to zero instead of positive. When adding sectoral employment shares, the relationship with GDP turns back to being positive. The agricultural share of employment is highly correlated with low GDP per capita but also high female hours of work as agriculture is often organized as family businesses where both men and women participate. These results suggest that both social norms and sectoral transitions play a large role in shaping female labor supply.

Table 2, Panel A shows that hours of work of prime-age men are negatively related to GDP per adult (elasticity of -0.06 in column 5) while hours of work of prime-age women are positively

related to GDP (elasticity of 0.2 in column 8). These two effects approximately offset each other, yielding an overall stability of prime-age hours with development (column 4). Columns 6 and 9 zoom in on hours per worker, capturing the intensive margin for men and women, while columns 7 and 10 focus on employment rates, capturing the extensive margin. The decline in male hours is driven entirely by the intensive margin (column 6) with no change along the extensive margin (column 7). Conversely, the increase in female hours is driven entirely by the extensive margin (column 10) with no change along the intensive margin (column 9). Therefore, prime-age men work fewer hours on the job with development and these hours are being replaced by more women entering the labor force, thus equalizing labor market outcomes between genders.

Labor force surveys do not cover unpaid domestic work, so it is not possible to estimate how much of this gender reshuffling over the course of development is driven by substitution between non-market and market hours of work. However, we can shed some light on this issue for a smaller set of 84 countries drawing on estimates from Charmes (2022), who compiles measures of domestic work by gender from time use surveys. Appendix Figure [A14](#) plots weekly home production hours by gender and total hours worked including home production against GDP per adult. Three results stand out. First, the relationship between domestic hours and development is the mirror image of that of market work: female domestic hours decrease, while male domestic hours increase (panel (a)). Second, this redistribution by gender is quantitatively almost as large as the one observed for market work. As a result, total hours worked including home production are relatively stable with development for both genders (panel (b)). Third and consequently, total hours per adult including home production are just as stable with development as market hours (panel (c)). If anything, total hours are even more stable than market hours at the highest levels of development, due to a slightly faster increase in male domestic work relative to the decline in female domestic work.

Hence, our main conclusions on the stability of hours with development are robust to accounting for domestic work, while our results on the reallocation of market time by gender are at least partially, if not fully, driven by a corresponding reallocation of home production time within the household. These results are consistent with Ramey (2009), who documents a similar

long-run stability and gender reorganization of home production hours in the United States over the course of the twentieth century (see also Aguiar and Hurst 2007; Ngai and Petrongolo 2017). Bridgman et al. (2018) and Gottlieb et al. (2024) reach similar conclusions cross-sectionally using time use surveys for a smaller sample of countries.

#### 4.5. Heterogeneity and Sensitivity to Alternative Specifications

We conclude this section by connecting our results to the pioneering study by Bick, Fuchs-Schündeln, and Lagakos (2018) and discussing the sensitivity of our results on the relationship between hours per adult and development. Table 6, Panel A reports cross-sectional estimates of the elasticity of hours per adult with respect to GDP per adult for various samples and specifications, together with its standard error, the adjusted R-squared, and the number of observations in each regression. We compare estimates that weight countries by their population size as in our benchmark analysis to unweighted regressions as in Bick, Fuchs-Schündeln, and Lagakos (2018). Our benchmark estimates are always weighted so as to be representative of the world population. However, unweighted estimates are also of interest when focusing on a subset of countries as in Bick, Fuchs-Schündeln, and Lagakos (2018).

The first three rows in Table 6, Panel A report estimates for the Bick, Fuchs-Schündeln, and Lagakos (2018) core sample (49 countries covering 23% of the world population), their full sample (79 countries covering 41%), and our full sample (160 countries covering 97%). We use our own estimates of hours worked in the latest available year (excluding COVID years) for all groups of countries. The corresponding scatter plots of hours per adult against GDP per adult are depicted in Figure 8, panels (a), (b), and (c).

In both panels (a) and (b), hours worked sharply decline with development with elasticities of -0.14 and -0.12 reported in Table 6 (unweighted estimates). These estimates imply a reduction in hours exceeding 70% over the full development spectrum (the gap between the richest and poorest countries is about 4.5 log units in GDP per adult), similar to the findings

reported in Bick, Fuchs-Schündeln, and Lagakos (2018).<sup>13</sup> Panel (c) extends this analysis to our sample of 160 countries. Two results stand out. First, although hours worked still decline with development, this relationship is much weaker: the unweighted elasticity reported in Table 6 is -0.046, corresponding to a decline of about 20% over the development spectrum. Second, there is considerable heterogeneity in working hours at all levels of development. The R-squared from a linear regression of log hours on log GDP per adult is only 5%, compared with 40% in panel (a) and 30% in panel (b) of Figure 8. Importantly, weighting each country by population as we do in our benchmark estimates has only fairly modest effects on the elasticity estimates in each of the three samples (Table 6).

Hence, hours worked decline less with development and development explains a smaller fraction of cross-country variations in hours worked than previously thought. These patterns are even more apparent in the time series, as we will see in Section 5.

Table 6 explores the robustness of our benchmark low elasticity findings. The elasticity remains in the range of -0.07 to -0.04 when excluding China and India or small and oil countries.

We then add the Muslim/Hindu population share and region fixed effects to the regression. The elasticity becomes more negative when including the Muslim/Hindu share, especially in unweighted regressions that also remove small and oil countries, reflecting the fact that Muslim/Hindu countries (46 countries, 36% of the world population) are considerably poorer and tend to work lower hours due to low female employment. With this specification, we estimate an elasticity that is similar in magnitude to that obtained with the Bick, Fuchs-Schündeln, and Lagakos (2018) full sample. In contrast, adding dummies for our seven world regions brings the elasticity to zero. Hence, the negative unconditional elasticity is entirely driven by broad differences in hours worked between only seven regions, in particular between long hours in Sub-Saharan Africa and East Asia and low hours in Western and Eastern Europe. Within these regions, where GDP per adult can still differ by a factor of ten or more (e.g., Burundi vs. South Africa, Cambodia vs. Japan, Haiti vs. Uruguay, or Yemen vs. Egypt), there is no significant

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<sup>13</sup>Estimates by Bick, Fuchs-Schündeln, and Lagakos (2018) slightly differ from ours because (1) they use older surveys and (2) they focus on GDP per capita rather than GDP per adult. Nonetheless, we obtain very similar unweighted elasticities if we use their database: -0.13 on their core sample and -0.10 on their full sample.

relationship between hours and development.

Finally, we consider the role played by the demographic structure. We construct demography-adjusted hours of work by recalculating hours per adult in each country after reweighting age and gender groups to match their distribution observed in Indonesia, a country at the middle of the development spectrum. This adjustment brings the elasticity slightly closer to zero.

In summary, our cross-sectional analysis suggests that development is associated with slightly lower hours per adult, with an elasticity around -0.03 to -0.06, but only explains 5-10% of cross-country variations in hours worked. This small decline is entirely driven by reductions in hours worked by the young and the elderly, which we linked to the development of schooling and pension systems. In contrast, hours worked by prime-age adults are uncorrelated with development in nearly all empirical specifications (see Appendix Table A6).<sup>14</sup>

## 5. Long-Run Trends in Hours Worked

As discussed above, we have gathered time series of labor force surveys for as many countries as we could. Our database allows us to construct long panels spanning at least 20 years for 86 countries broadly distributed across world regions and along the development spectrum (see Appendix Figure A2). These series allow us to analyze long-run trends in hours worked, assess whether they match the cross-country comparisons we have analyzed in Section 4, and further refine our explanatory mechanisms. In particular, the time series can help us evaluate whether today's developing countries are retracing the historical path once followed by frontier economies or instead exhibit different dynamics.<sup>15</sup>

### 5.1. Prime-Age Adults

We start with prime-age adults and then turn to the young and the elderly in the next subsections (see Appendix Figure A15 for results on all adults aged 15+). Figure 9 depicts the

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<sup>14</sup>Appendix Tables A4 and A5 reproduce these results separately for hours per worker and employment rates.

<sup>15</sup>As a caveat, let us highlight that we should not necessarily expect the cross-sectional and panel estimates to capture the same relationships, given that our panel regressions include country fixed effects whereas the cross-sectional estimates do not. As a result, our cross-sectional analysis picks up additional cross-country differences that are controlled for in our panel regressions.

evolution of hours worked among prime-age adults by decade, for both genders combined in panel (a) and separately for men and women in panel (b). The decomposition into employment rates and hours per worker is provided in Appendix Figures [A16](#) and [A17](#). For this graphical illustration, we focus on 43 countries grouped into nine countries or world regions. Hours are plotted against country or region log GDP per adult in the corresponding period, expressed in 2023 PPP USD. In each series, the last data point corresponds to the 2020s (excluding COVID years 2020-21), the next data point to the 2010s, etc. For each decade, we average across all surveys available in each country. We always weight by population size.

The United States series combines Current Population Survey data since 1962 with Ramey and Francis (2009) data for 1900-1959. This very long U.S. time series is useful to compare an advanced economy in its earlier stage of development with current low- and middle-income countries. As we have discussed earlier, the United States is the only country for which there exists very long homogeneous series covering the full population working in all industries, making it truly comparable to the modern labor force surveys we use.

Figure 9, panel (a) reveals striking stability over decades in hours worked by prime-age adults within each region/country. The U.S. series display almost perfect stability over a century (except for the Great Depression dip in the 1930s). Developing countries tend to show a slight increase, perhaps most marked in Sub-Saharan Africa. Europe and Latin America, where we have the most comprehensive set of countries, show almost perfect stability over four decades or more. Table 2, Panel B, column 4 shows that there is a small positive elasticity of 0.04 when pooling the 2,162 surveys with long time series (at least two decades) and including country fixed effects.

## 5.2. Gender

However, this stability of prime-age hours over time masks striking offsetting trends by gender. Figure 9, panel (b) repeats the same time series analysis but disaggregated by gender. Working hours generally increase for prime-age women while they symmetrically decrease for prime-age men, explaining the stability in panel (a). The increase in female hours is almost universal. It

is visible both in regions that have grown slowly such as Latin America and in fast growing countries such as Indonesia or Pakistan. Appendix Figure A17 shows that the decrease for men comes from the intensive margin while the increase for women comes from the extensive margin. This common trend suggests that this process is not solely related to economic development but also reflects broader societal trends.

Table 2, Panel B confirms that, longitudinally within countries, hours worked among prime-age men are negatively correlated with GDP per adult (column 5) while hours worked among prime-age women are positively related to development (column 8), with elasticities of -0.13 and 0.34, respectively. The decline in male hours is primarily driven by the intensive margin (columns 6 and 7), while the increase in female hours is driven entirely by the extensive margin (columns 9 and 10).

Appendix Table A8 delves further into this question within the household. The rise in hours worked by women with GDP is stronger among women living with adult men (in most cases married or cohabiting) than among other women, in line with previous evidence on the United States (Jones, Manuelli, and McGrattan 2015). This finding suggests that the rise of female hours is indeed tied to changes in norms within couples. In contrast, for men, the decline in hours happens for all household types.

Quantitatively, elasticities of prime-age male and female hours (columns 5 and 8) are substantially larger in the panel data than in the cross-section of countries analyzed in Panel A. This pattern is consistent with the fact that the replacement of men's long hours by higher female employment has been occurring faster in contemporary developing countries than it did historically in frontier economies. For example, the Netherlands in 1970 had a prime-age female employment rate in the low 20s (Saez 2021, Figure 6A), comparable to Afghanistan today (Appendix Figure A11(a)). We see at least two sets of possible factors driving this pattern. First, it could reflect shifts in global social norms, including the influential view promoted by international organizations that women's economic empowerment is a central element of development and should be encouraged. Second, it could also be linked to the development of new technologies, such as electricity (Vidart 2024), home appliances and labor-saving consumer durables

(Bowden and Offer 1994; Greenwood, Seshadri, and Yorukoglu 2005; Greenwood et al. 2016), or the contraceptive pill (Goldin and Katz 2002), which have become available in developing countries at a much earlier stage of development than they did in past frontier economies.

Therefore, both cross-sectional comparisons and within-country time series show a great reshuffling of prime-age hours between men and women: men work fewer hours on their jobs and those lost hours are replaced by women entering the labor force, which is a powerful force toward gender equality in the labor market.<sup>16</sup>

### 5.3. Young

Figure 10, panel (a) depicts the evolution of hours worked by the young (aged 15-19) by decade, focusing on the same regions and countries as in Figure 9. The decomposition into employment rates and hours per worker is provided in Appendix Figure A18. Panel (a) shows almost universal and often large declines in hours of work of the young over time. The drop is particularly large in Latin America and takes place in a context with very low economic growth.

Table 2, Panel B, column 2 confirms the sharp drop in hours worked by the young, with an elasticity almost 3 times as large as in the cross section in Panel A. This rapid decline likely reflects the fact that the development of schooling has been proceeding faster in developing countries than it did in past frontier economies, perhaps as international organizations such as the World Bank have promoted education as a key ingredient for development (Jones 2007).<sup>17</sup>

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<sup>16</sup>The macroeconomics literature has built models capturing crowd-out of men's hours by women's hours. Knowles (2013) develops a theory in which household bargaining can have small impacts on aggregate labor supply but large effects on gender gaps in work hours. Jones, Manuelli, and McGrattan (2015) propose a model with significant crowd-out in the long run. Juhn and Murphy (1997) and Blank and Gelbach (2006) find limited evidence of crowd-out in the United States. Albanesi, Olivetti, and Petrongolo (2023) document that rising female employment coincided with only small declines in male employment across developed countries, while Fukui, Nakamura, and Steinsson (2023) find modest crowd-out at business cycle frequency in the United States.

<sup>17</sup>As illustrative evidence, Appendix Figure A20 confirms that developing countries are expanding schooling at a much earlier stage of development than richer countries did. For instance, secondary school enrollment reached about 80% in India in 2010, while it was only 15% in France when it had the same level of GDP per adult.

## 5.4. Elderly

Figure 10, panel (b) plots the evolution of hours worked among the elderly. The decomposition into employment rates and hours per worker is provided in Appendix Figure A19. In contrast to the young, elderly hours have remained broadly stable longitudinally over recent decades—except in the United States, where they declined steeply over the 1900–1960 period.

Table 2, Panel B, column 3 confirms that hours worked by the elderly are not falling with log GDP per adult in the panel, while they are falling sharply in the cross section in panel A. The stability of hours in developing countries contrasts with the path previously taken by richer countries, which experienced large drops in elderly hours in the middle of the 20th century (e.g., Blundell, French, and Tetlow 2017). Although we lack historical data, it is likely that developing countries have not been adopting the generous public pensions that many richer countries developed in the past. As with schooling, it is also possible that the recommendations of international organizations on sustainable government spending have influenced pension policy decisions in developing countries (e.g., Queisser 2000). A related interpretation is that the experience of richer countries—many of which are now trying to increase elderly hours due to difficulties in financing their pension systems—and the early decline in fertility could have led policymakers to be more cautious in promoting generous pension policies.

## 5.5. Heterogeneity and Sensitivity to Alternative Specifications

As in the cross section, it is useful to compare estimates of the elasticity of hours per adult with respect to GDP per adult for different specifications and groups of countries. Table 6, panel B reports elasticities of hours with respect to GDP per adult, together with the share of time series variation in hours worked explained by GDP per adult (the within R-squared). As a starting point, we run a pooled panel regression of log hours on log GDP per adult without any fixed effects. This regression yields a more negative elasticity than in our cross-sectional database, between -0.1 (weighted) and -0.07 (unweighted). This result reflects the fact that our panel database covers fewer developing countries with low hours, especially Muslim/Hindu-majority countries, and strongly over-represents European countries with low hours (see Appendix Fig-

ure [A2](#)).

We then focus on within-country variations in hours worked by adding country fixed effects. The elasticity drops considerably to around -0.02 to -0.01. The within R-squared is below 1%.

As a complementary statistic of interest, Boppart and Krusell (2020) report a rate of decline in hours worked of 0.3-0.5% per year in a sample of rich countries over the past decades, implying that halving hours worked takes around 175 years. In simple panel regressions relating log hours per adult to time with country fixed effects, we estimate annual rates of change around -0.1%: halving hours worked would take about half a millennium in our sample of countries.

We identify two main dimensions of heterogeneity. First, the elasticity is positive in low- and lower-middle-income countries (around 0.01-0.03), while it is negative in upper-middle-income and high-income countries (around -0.03).<sup>18</sup> This pattern is consistent with the mild bell shape in hours worked over the course of development documented in the cross section in [Figure 2](#). Second, we split the sample into Muslim/Hindu countries, Western Europe, and the rest of the world. In Muslim/Hindu countries, hours worked are strongly positively associated with development, reflecting significant increases in female hours in recent decades. In contrast, we estimate a large negative elasticity in Western Europe (-0.07 without weights and -0.26 when weighting by population due to the drop in hours worked in France in recent decades). This finding is consistent with studies highlighting the role of institutions and public policies in explaining the uniquely low levels of European hours (e.g., Alesina, Glaeser, and Sacerdote 2005), which motivates our analysis of taxes, transfers, and regulations in the next section. Finally, elasticities for other countries in our sample are around -0.05 to -0.03, very similar to those found in our cross-sectional analysis.

Appendix Tables [A4](#), [A5](#), and [A6](#) reproduce [Table 6](#) for hours per worker, employment rates, and prime-age hours, respectively. In the panel data, hours per worker decline and employment rates increase with GDP per adult in almost all samples and specifications. Prime-age hours are positively correlated with economic growth, except in Western Europe. Appendix [Table A7](#) reproduces the panel analysis after excluding Muslim/Hindu, small, and oil countries from the

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<sup>18</sup>We categorize countries into these four groups using the World Bank's country classification by income level.

sample. The results are qualitatively similar.

In summary, our analysis reveals that hours worked by the young decline faster with development in the panel data than in the cross section, while elderly hours are stable and prime-age hours increase. The last two forces quantitatively dominate, explaining the much weaker relationship between hours per adult and GDP per adult observed in panel data.

The key conclusion is that the structure of hours worked can take different paths over the development process and is not fully determined by GDP per adult. While our analysis points to some degree of consistency—such as declining youth hours and rising female hours with development in both cross-sectional and panel data—there is also substantial scope for evolving social norms, policy choices, and new technologies to shape the path of working hours in developing countries in ways that differ from those observed in past frontier economies.

## **6. Prime-Age Hours: The Role of Taxes, Transfers, and Regulations**

Our previous analysis has shown that working hours of the young and elderly are highly negatively correlated with school attendance and pension benefits. In this section, we aim to complete our analysis by investigating which public policies can help explain hours of work of prime-age workers aged 20-59, which constitute about 70% of hours worked worldwide. We focus on the role of taxes on labor and working hours regulations, which are the main “price” and “quantity” policies shaping labor markets. Our analysis is correlational and does not imply causality. Given substantial challenges in constructing comparable indicators of social and labor regulation policies, we view the results in this section as more exploratory. We restrict ourselves to cross-sectional comparisons due to limited availability of panel data covering our main indicators of interest.

Considerable attention has been paid to analyzing the role of taxes in shaping hours worked. As we discussed, the very large variation in GDP per adult across countries is associated with only modest differences in hours worked. In the standard labor supply model, this result implies that the uncompensated (Marshallian) elasticity of hours worked with respect to the real wage is small. This point has been made many times in the literature (see, e.g., Bick, Fuchs-

Schündeln, and Lagakos 2018 across countries and Andreescu et al. 2025 in long time series) and is broadly consistent with an enormous micro-level empirical literature (see, e.g., Pencavel 1986 and Blundell and MaCurdy 1999 for classic surveys). Our cross-sectional and time series results in Table 2 pointed to very small elasticities of hours with respect to GDP per adult for the prime-age, consistent with zero uncompensated elasticities of labor supply.

However, taxes are different because they are used to fund transfers. At the macro level, an increase in taxes on labor income combined with an increase in transfers is akin to a compensated reduction in the wage rate. This result has been emphasized by previous studies on the macro-level effect of taxes on hours worked (e.g., Prescott 2004; Rogerson 2008; McDaniel 2011; Bick and Fuchs-Schündeln 2018; Bick et al. 2022). In the presence of income effects, the compensated (Hicksian) labor supply elasticity is larger than the uncompensated elasticity.

We consider a simple static labor supply model in Appendix D to formally show how reduced-form elasticities of labor supply with respect to the wage rate (proxied by GDP per adult) and to  $1 - \tau_L$  (one minus the tax rate on labor income) relate to the uncompensated and compensated structural elasticities when labor taxes partly fund transfers. If taxes are fully rebated as transfers and the economy initially has no labor taxes, then the reduced-form elasticity of labor supply with respect to the wage rate is exactly the structural uncompensated elasticity, while the reduced-form elasticity with respect to  $1 - \tau_L$  is exactly the structural compensated elasticity. If taxes are only partially rebated as transfers or if there are pre-existing taxes, the reduced-form elasticities are mixtures of the structural elasticities. However, any gap between the two reduced-form elasticities, as we find, remains evidence of income effects.

We combine our new database on hours worked with data from Bachas et al. (2026). Bachas et al. (2026) construct macro-level average tax rates on labor income  $\tau_L$  that are fully consistent with national accounts by combining labor income tax revenue series with estimates of labor income shares.<sup>19</sup> Therefore, the tax rates we use reflect actual nationwide average tax rates on

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<sup>19</sup>Bachas et al. (2026) also construct series on consumption and capital income tax rates. We have experimented with including these taxes in our analysis. In contrast to labor taxes, they are at best weakly related to hours worked, and the coefficients are imprecisely estimated, perhaps because cross-country variation in these taxes is much smaller than for labor taxes. Moreover, adding these other taxes does not affect the coefficients on labor taxes. Hence, for simplicity, we focus solely on labor taxes in the analysis that follows.

labor income and automatically factor in tax evasion and avoidance, which are common in the large informal sectors of developing countries.

## 6.1. The Role of Labor Taxes

Let us start with a simple graphical analysis. Combining Bachas et al. (2026) series with our data, Figure 11, panel (a) depicts the correlation between average labor tax rates and unconditional hours of work among prime-age men.

Panel (a) shows a strong negative correlation between labor tax rates and prime-age male hours across countries. The negative relationship for Western Europe and the Anglosphere (depicted in blue) was already documented in previous studies focusing on OECD countries. What is striking is that the relationship continues to hold when including less developed countries, which tend to combine lower labor taxes with higher male hours. India and China extend the negative relationship remarkably well. The correlation is large: hours drop from 40-45 hours in countries with almost no taxes on labor income to 25-30 hours in countries with high labor taxes. However, substantial heterogeneity remains among countries with low labor tax rates.

A regression analysis allows us to examine these correlations more systematically. We always include log GDP per adult and Muslim/Hindu population shares in the regressions. Table 7, panel A reports results of cross-country regressions of various measures of hours worked on labor tax rates. We regress log hours worked on log net-of-labor tax rates,  $\log(1 - \tau_L)$ , so that all estimates can be interpreted as elasticities of hours worked with respect to net-of-tax rates. Estimates are weighted by adult population. The sample covers 138 countries (96% of the world population) for which both hours worked and policy variables are available. We focus on prime-age adults but also report estimates for all adults aged 15+ in column 1.

We find that  $\log(1 - \tau_L)$  is strongly related to hours worked. The estimated elasticity of prime-age hours with respect to  $1 - \tau_L$  is 0.9. This elasticity is driven primarily by the intensive margin: the coefficient is 0.6 for hours per worker and 0.2 for employment rates. The elasticities

are large for both prime-age men and prime-age women (0.8 and 1.2).<sup>20</sup>

In contrast, the coefficient on log GDP per adult is much smaller, below 0.1 in all columns except for women.<sup>21</sup> As we mentioned above and discuss in Appendix D, this discrepancy in elasticities is consistent with income effects in the standard static labor supply model. Therefore, if labor taxes reduce hours of work, the causality channel must operate either through the transfers these taxes fund or through their correlation with other policies such as working hours regulations. We explore these two channels next.

## 6.2. The Role of Transfers

Using data on government transfers, we can test whether the large labor tax elasticities are driven by income effects (e.g., Rogerson 2006, 2007; Rogerson and Wallenius 2009). We draw on data from Fisher-Post and Gethin (2025) and Gethin (2025a), who construct disaggregated public spending series for most countries in the world since 1980. We focus on social spending as a share of GDP, defined as all cash and quasi-cash transfers to individuals, which is the key component that can reduce labor supply through traditional income effects. We exclude public pensions, which target the elderly rather than the prime-age group on which we focus in this section. Appendix Table A11 reports similar results when adding pension spending in the regression in the smaller sample of countries for which this variable is available.

Table 7, panel B adds social spending as a share of GDP in the tax regression.<sup>22</sup> The elasticities with respect to net-of-labor taxes become smaller, falling by half to around 0.3-0.7 in most columns, but generally remain significant. The social spending variable is significantly

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<sup>20</sup>Appendix Table A9 reports results for the truly unconditional elasticity of hours with respect to  $(1 - \tau_L)$ , that is, before adding log GDP and Muslim/Hindu population shares. The elasticity is generally positive but smaller, except for women for whom it is negative due to the confounding role played by Muslim/Hindu countries, which have both low taxes and low female hours. Appendix Table A10 reports panel estimates with country fixed effects. The elasticity of prime-age hours with respect to  $(1 - \tau_L)$  is positive and significant but smaller: 0.3-0.4 instead of 0.9.

<sup>21</sup>If we run the same regressions without labor tax rates, we obtain elasticities of hours worked with respect to GDP of about -0.08 for hours per adult and close to zero for all other columns, similar to elasticities controlling for Muslim/Hindu population shares reported in Table 6.

<sup>22</sup>At the micro level, there is an obvious endogeneity between hours worked and transfer receipt as many transfers are means-tested and hence larger for those with low hours. At the macro level, our estimates capture the response of transfers in the form of both income effects and any additional substitution effects created by means-tested programs.

negative. This result suggests that countries that use labor taxes to fund social transfers have lower prime-age hours than countries that use labor taxes for other purposes, such as education or public goods. Quantitatively, adding one point of GDP to social spending is associated with a reduction in hours worked of about 2-3%.

However, the labor tax elasticities in Panel B remain substantially larger than the log GDP per adult elasticities. Therefore, our tentative conclusion is that transfers and income effects can only partly explain why labor taxes are so strongly negatively related to hours of work. Conceivably, labor taxes may also proxy for the development of the welfare state, which includes not only economic transfers but also labor regulations (e.g., overtime pay or paid vacation) that can affect hours worked and to which we now turn.

### **6.3. The Role of Regulations**

The development of the social state and of the large labor taxes that fund it is correlated with the development of working hours regulations that can also play a role in reducing hours of work. Countries often regulate normal working hours (e.g., 40 hours in the United States), overtime premiums (50% in the United States), night work, and work on holidays and weekends. As shown earlier in Figure 1(d), the density of weekly hours displays large spikes, suggesting that many workers follow standard work hours schedules. Countries can also mandate paid leave and vacation or maximum hours per day or week. The World Bank has compiled a database, [Employing Workers](#), covering work regulations by country. We use their 12 variables on working hours regulations to create a single index ranging from 0 to 1 using principal component analysis. Such regulations generally do not apply to the self-employed (e.g., family farm workers) and are typically enforced primarily on formal workers (Almeida and Carneiro 2012). Therefore, regulations matter more in countries with a larger formal sector. For this reason, we create an “effective regulations index” defined as the product of the regulations index and the share of employment in the formal sector. The index ranges from 0 (countries with no formal employment and/or the lowest regulations) to 1 (countries with fully formal employment and the highest

regulations).<sup>23</sup> Given the limited number of indicators in the Employing Workers database and the partial overlap between formality and compliance, we view this indicator as a highly imperfect and noisy proxy for the intensity of regulations on hours worked.

Table 7, Panel C further adds the effective regulations index to the regression. Two results stand out.

First, the effective regulations index is negatively correlated with hours worked. The coefficients are generally significant and large. For example, going from no regulations to the strictest regulations (as in France) is associated with a reduction in prime-age hours of 0.3 log units (about 35%). These results are consistent with studies in the OECD context suggesting that regulations reduce working hours (Causa 2008; Batut, Garnero, and Tondini 2023).

Second, the elasticity of hours with respect to  $1 - \tau_L$  drops dramatically and becomes close to zero and insignificant in all columns. The coefficient for prime-age hours drops from 0.5 to 0.1. The coefficients on social spending and regulations are both generally negative and statistically significant. This result suggests that both social spending and working hours regulations play a role in lowering hours of work. The negative coefficient on social spending combined with the zero elasticity with respect to  $1 - \tau_L$  is consistent with income effects on labor supply and a modest uncompensated elasticity of labor supply (and hence a positive compensated elasticity of labor supply). We are able to explain about 50-60% of cross-country variations in hours worked with all the variables included in panel C. Using a simple Shapley decomposition for the regression on prime-age hours, we find that regulations explain about 13 points of the R-squared and social spending 3 points. Figure 11(b) depicts the absence of cross-country correlation between prime-age male hours and labor taxes once conditioning on regulations and social spending (i.e., residualizing hours on these two variables).<sup>24</sup>

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<sup>23</sup>Appendix Figures A21(a-c) and A22(b-d) plot the formal employment share, the regulations index, and the effective regulations index by country against log GDP per adult and prime-age hours worked, respectively.

<sup>24</sup>Appendix Table B7 reproduces Table 7 without weighting by population. The conclusions are similar, except that the coefficients on social spending are close to zero and insignificant while the coefficients on regulations are larger. We also investigate heterogeneity by country income group in Appendix Tables A12 (weighted) and B9 (unweighted). The results are similar.

## 7. Conclusion

This paper assembled a new collection of labor force surveys to construct a comprehensive database on hours worked in 160 countries covering 97% of the world population in cross section. This database allowed us to build the first truly global hours worked statistics by age and gender. We also constructed long time series in 86 countries, enabling us to study the evolution of hours worked in different regions of the world over the past decades. One output of our work is a publicly available [database](#) on working hours by age, gender, and other sociodemographic characteristics, which can be used by researchers to reproduce almost all our results and further explore cross-country and time variations in hours worked around the world.

We have obtained a number of substantive findings. Global hours worked are very strongly bell-shaped with age. Women account for 35% of total hours worked. Hours worked by the young (aged 15-19) and the elderly (aged 60+) fall with development, driven by the expansion of schooling and pension systems. Prime-age (20-59) hours worked are bell-shaped for men with GDP while they are increasing for women. The fall in male hours worked in middle-to-higher-income countries is driven by reduced hours per worker and is quantitatively offset by increases in female employment rates. Overall, prime-age hours worked are remarkably stable over the course of development, both in the cross section and longitudinally.

Labor taxes are strongly negatively correlated with prime-age hours worked both in international comparisons and over time within countries. We found some evidence that this correlation is reduced after adding social spending, consistent with income effects, but only partially. The correlation disappears after also adding working-time regulations applying to the formal sector, suggesting that the development of the social state and the large labor taxes that fund it is correlated with the development of labor regulations that are also associated with reductions in hours worked at the highest levels of development. Together, our findings suggest that cultural and social choices often encoded in public policy powerfully shape hours worked over and above pure economic development.

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Table 1: Global Hours Worked

	By Gender			By Age		
	All	Men	Women	Young	Prime-Age	Elderly
Hours per Adult	24.5	31.7	17.4	7.6	30.7	11.0
Hours per Worker	41.5	44.6	36.9	33.2	42.6	35.5
Employment	59.3%	71.3%	47.7%	23.2%	72.3%	31.2%

*Notes.* This table reports global weekly hours worked statistics by gender and broad age group for all adults (aged 15+). For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Estimates are weighted by adult population size in each country to be representative. The sample includes 160 countries covering 97% of the world adult population. Hours worked are defined in almost all countries as actual hours worked (rather than usual) in the reference week across all jobs including self-employment that contributes to GDP (non-market home produced services such as cleaning, cooking, and childcare are excluded). The employment rate is the fraction of adults having a job (including those on vacation or sick leave). Hours per adult are decomposed into the product of hours per worker and the employment rate. Young: aged 15-19. Prime-age: aged 20-59. Elderly: aged 60+.

Table 2: Elasticities of Hours Worked with Respect to GDP per Adult

	(1)	(2)	(3)	(4)	Prime-Age Men			Prime-Age Women		
					(5)	(6)	(7)	(8)	(9)	(10)
	All Adults	Young 15-19	Elderly 60+	Prime-Age 20-59	Hours per Adult	Hours per Worker	Employment Rate	Hours per Adult	Hours per Worker	Employment Rate
<b>Panel A: Cross Section</b>										
Log GDP Per Adult	-0.04 (0.03)	-0.35*** (0.09)	-0.30*** (0.05)	0.02 (0.02)	-0.06** (0.03)	-0.06*** (0.02)	-0.00 (0.01)	0.20*** (0.06)	0.01 (0.02)	0.18*** (0.06)
Mean Hours	24.7	6.6	12.5	30.7	39.3	45.6	86.3	22.3	37.5	59.6
N	160	159	160	160	160	160	160	160	160	160
Adjusted $R^2$	0.03	0.23	0.30	0.00	0.12	0.20	-0.00	0.11	-0.01	0.13
<b>Panel B: Panel Data</b>										
Log GDP Per Adult	-0.01 (0.01)	-0.89*** (0.05)	0.07* (0.04)	0.04*** (0.01)	-0.13*** (0.01)	-0.09*** (0.01)	-0.04*** (0.01)	0.34*** (0.02)	-0.03** (0.01)	0.37*** (0.02)
Mean Hours	22.3	8.1	9.3	28.5	36.3	43.4	83.7	21.0	36.1	58.9
N	2,162	2,139	2,162	2,162	2,162	2,162	2,162	2,162	2,162	2,162
Within $R^2$	0.00	0.33	0.00	0.03	0.19	0.21	0.05	0.37	0.01	0.42

*Notes.* This table reports regression results relating log hours worked per adult to log GDP per adult, across countries in panel A and within countries over time in panel B. Each column focuses on a specific demographic group. All adults = all adults aged 15+. Panel A includes 97% of the world population from 160 countries using the most recent survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Panel B includes a subset of 86 countries for which we have time series spanning more than 20 years (see Appendix Figure A2). Regressions in Panel B include country fixed effects. In both panels, regressions are weighted by adult population size in each country to be representative. In both the cross-sectional and panel analyses, there is no strong link between log GDP and log hours per adult or log hours per prime-age adult. Hours of work of the young decline with GDP per adult, especially in the panel. Hours of work of the elderly decline with GDP per adult in the cross section but not in the panel. Hours of work of prime-age men decline with GDP per adult while hours of work of prime-age women increase (columns 5 and 8). The two effects approximately offset each other (column 4). The decline in male hours is primarily driven by the intensive margin (hours per worker, column 6), while the increase in female hours is entirely driven by the extensive margin (employment rate, column 10). Unweighted regressions are presented in Appendix Table B1.

Table 3: Log Hours Worked by the Young (15-19)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.36*** (0.10)		0.05 (0.06)	0.29** (0.12)
Young School Attendance		-3.89*** (0.39)	-4.13*** (0.47)	-3.98*** (0.54)
Employment: Agriculture				1.26** (0.57)
Employment: Manufacturing				-0.15 (0.83)
Mean Hours	7.2	7.2	7.2	7.2
N	149	149	149	149
Adjusted $R^2$	0.23	0.61	0.61	0.65

*Notes.* This table reports results from cross-country regressions of log hours of work of the young (aged 15-19) on various determinants. For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Regressions are weighted by adult population size in each country to be representative. The sample includes 149 countries for which all the determinants are available and covers 92% of the world adult population. Young school attendance is the fraction (between 0 and 1) of young adults aged 15-19 attending school. Employment: agriculture (resp. manufacturing) is the share of all workers employed in agriculture (resp. manufacturing). Hours worked by the young are negatively correlated with log GDP per adult (column 1). School attendance among the young is the main determinant of their hours worked (columns 2-4) and fully explains the negative relationship with GDP (columns 3-4). Unweighted regressions are presented in Appendix Table B3.

Table 4: Log Hours Worked by the Elderly (60+)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.37*** (0.08)		0.21 (0.13)	0.15 (0.13)
Pension Spending		-7.09*** (2.14)	-6.05*** (2.19)	-6.23*** (2.08)
Elderly Population Share		0.41 (0.86)	-1.21 (1.22)	-0.13 (1.24)
Pension Coverage		-0.70*** (0.21)	-0.92*** (0.25)	-1.10*** (0.23)
Employment: Agriculture				-0.28 (0.51)
Employment: Manufacturing				-1.58** (0.61)
Mean Hours	11.8	11.8	11.8	11.8
N	92	92	92	92
Adjusted $R^2$	0.42	0.72	0.74	0.77

*Notes.* This table reports results from cross-country regressions of log hours of work of the elderly (aged 60+) on various determinants. For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Regressions are weighted by adult population size in each country to be representative. The sample covers 92 countries for which all the variables are available. It covers 78% of the world adult population. Pension coverage is defined as the fraction of adults aged 60+ living in a household where at least one person receives a public pension and the household public pension amount equals at least 10% of GDP per adult in the country. Pension spending is government pension spending relative to GDP. Elderly population share is the share of the population aged 60+. Employment: agriculture (resp. manufacturing) is the share of all workers employed in agriculture (resp. manufacturing). Pension coverage and pension spending are the main determinants of hours worked among the elderly (columns 2-4) and fully explain the negative relationship with GDP (column 3). Unweighted regressions are presented in Appendix Table B4.

Table 5: Log Hours Worked by Prime-Age Women

	(1)	(2)	(3)	(4)
Log GDP Per Adult	0.22*** (0.07)		-0.04 (0.06)	0.27*** (0.10)
Muslim/Hindu Share		-0.61*** (0.12)	-0.63*** (0.12)	-0.75*** (0.15)
Former Communist Country		0.20*** (0.04)	0.20*** (0.04)	0.21** (0.10)
% Women Living with Young Children		-0.30 (0.33)	-0.42 (0.40)	-0.61* (0.36)
Employment: Agriculture				1.85*** (0.53)
Employment: Manufacturing				-0.29 (1.05)
Mean Hours	22.0	22.0	22.0	22.0
N	134	134	134	134
Adjusted $R^2$	0.16	0.61	0.61	0.74

*Notes.* This table reports results from cross-country regressions of log hours of work of prime-age women (aged 20-59) on various determinants. For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Regressions are weighted by adult population size in each country to be representative. The sample covers 134 countries for which all the variables are available. It covers 89% of the world adult population. % Women living with young children is the fraction of prime-age women living in households with one or more children aged 0-5. A larger Muslim/Hindu population share is associated with lower hours worked while being a former communist country is associated with higher hours worked. GDP per adult does not have a consistent effect on hours of work of prime-age women. The relation is positive without controls (column 1), becomes negative with the three sociodemographic controls (column 3), and becomes positive again when controlling for the share of total (male and female) employment in agriculture and manufacturing (column 4). Unweighted regressions are presented in Appendix Table B5.

Table 6: Elasticities of Hours Worked with Respect to GDP per Adult: Sensitivity to Alternative Samples and Specifications

	Population-Weighted				Unweighted			
	Coefficient	SE	$R^2$	$N$	Coefficient	SE	$R^2$	$N$
<b>A. Cross Section</b>								
<b>Bick et al. 2018 Core Sample</b>	-0.114**	(0.045)	0.269	49	-0.143***	(0.029)	0.403	49
Bick et al. 2018 Full Sample	-0.113***	(0.034)	0.265	79	-0.119***	(0.021)	0.287	79
<b>Full Sample</b>	<b>-0.04</b>	<b>(0.027)</b>	<b>0.033</b>	<b>160</b>	<b>-0.046***</b>	<b>(0.016)</b>	<b>0.050</b>	<b>160</b>
Excluding China and India	-0.061***	(0.020)	0.103	158	-0.046***	(0.016)	0.052	158
Excluding Small and Oil Countries	-0.039	(0.029)	0.033	124	-0.067***	(0.017)	0.119	124
Controlling for Muslim/Hindu Share	-0.08***	(0.023)	0.141	160	-0.056***	(0.017)	0.077	160
Controlling for Muslim/Hindu and Excl. Small/Oil	-0.077***	(0.024)	0.128	124	-0.096***	(0.017)	0.225	124
Controlling for Region Fixed Effects	-0.002	(0.038)	0.593	160	0.011	(0.030)	0.277	160
Using Fixed Weights by Age-Gender	-0.013	(0.022)	0.005	160	-0.036**	(0.016)	0.035	160
<b>B. Panel Data</b>								
Full Sample without Country Fixed Effects	-0.101***	(0.007)	0.190	2162	-0.073***	(0.006)	0.070	2162
<b>Full Sample</b>	<b>-0.012</b>	<b>(0.012)</b>	<b>0.002</b>	<b>2162</b>	<b>-0.022***</b>	<b>(0.007)</b>	<b>0.004</b>	<b>2162</b>
Low/Lower-Middle-Income Countries	0.034**	(0.014)	0.042	306	0.014	(0.016)	0.003	306
Upper-Middle/High-Income Countries	-0.031**	(0.015)	0.009	1856	-0.029***	(0.008)	0.007	1856
Muslim/Hindu Countries	0.052***	(0.013)	0.137	267	0.089***	(0.018)	0.087	267
Western European Countries	-0.258***	(0.034)	0.339	576	-0.071***	(0.013)	0.050	576
Other Countries	-0.054***	(0.018)	0.024	1329	-0.027***	(0.010)	0.005	1329

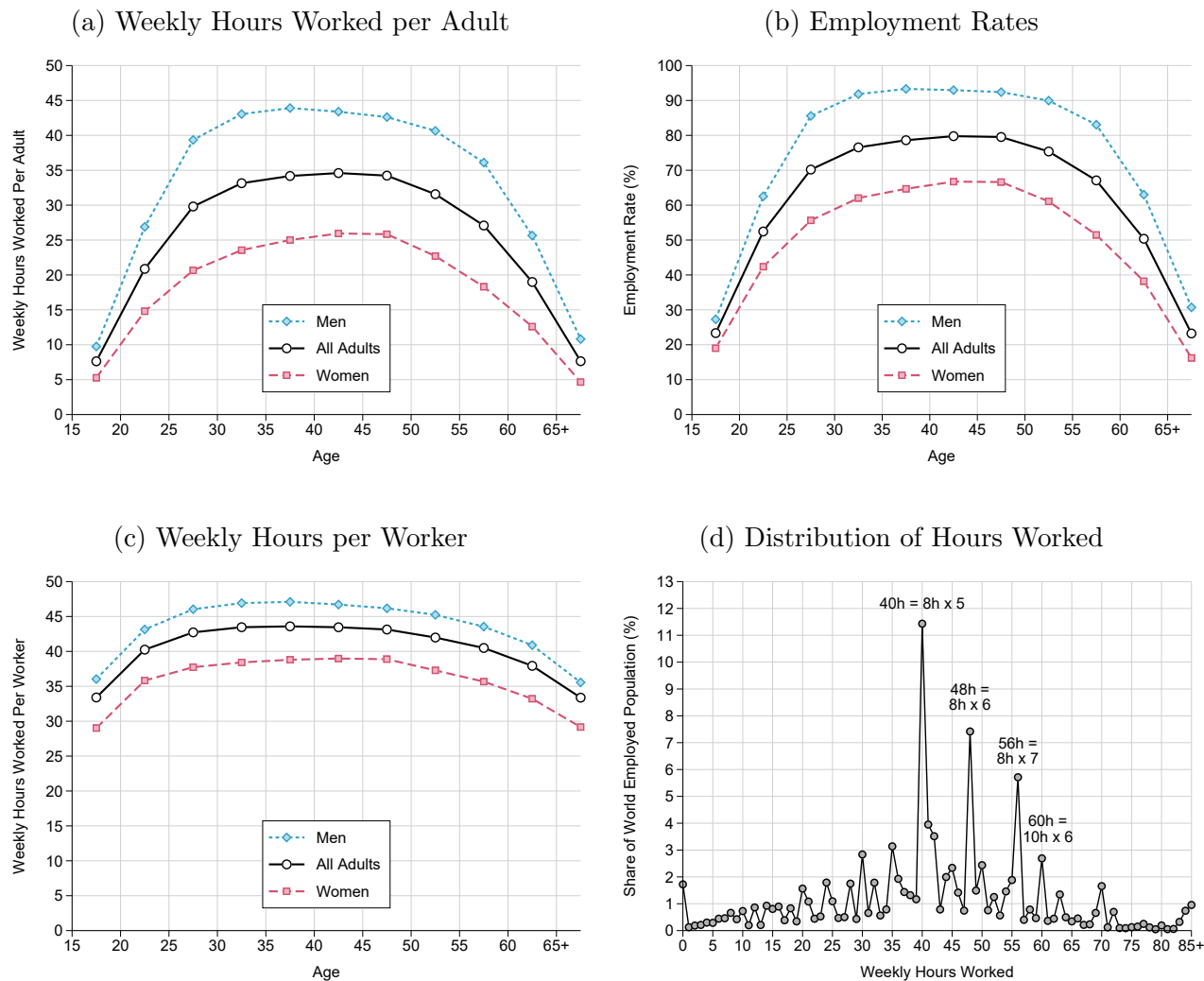
*Notes.* This table reports estimates of the elasticity of hours per adult with respect to GDP per adult, its corresponding standard error in parentheses, the adjusted R-squared (panel A and first row of panel B) or within R-squared (other rows of panel B), and the number of observations associated with the corresponding regression for different samples and specifications. Panel A reports results of cross-country regressions. For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Panel B reports results of panel regressions with country fixed effects (except the first row, which does not include fixed effects), focusing on 86 countries for which we have longer time series spanning more than 20 years (see Figure A2). We report results from both population-weighted (columns 2 to 5) and unweighted (columns 6 to 9) regressions. Bick et al. 2018 Core Sample and Full Sample: restrict the analysis to the core and full sample of countries covered by Bick, Fuchs-Schündeln, and Lagakos (2018) (excluding Taiwan, which is not covered in our database), using our own estimates of hours worked in the most recent year available (excluding COVID years) for these countries. Excluding small and oil countries: exclude countries with an adult population of less than one million as well as oil-rich countries. Controlling for region fixed effects: add dummies for our seven world regions (see Appendix Figure A1). Using fixed weights by age-gender: recalculate hours per adult using fixed weights by age and gender matching their distribution observed in Indonesia. Western European countries: restrict the sample to 17 Western/Northern European countries.

Table 7: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations

	(1)	(2)	(3)	(4)	(5)	(6)
	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours Men	Prime-Age Hours Women
<b>A. Before Controls</b>						
$\log 1 - \tau(L)$	1.19*** (0.17)	0.87*** (0.16)	0.63*** (0.12)	0.24* (0.13)	0.75*** (0.16)	1.17*** (0.31)
Log GDP Per Adult	0.05* (0.03)	0.08*** (0.03)	0.05** (0.02)	0.02 (0.02)	0.05* (0.03)	0.13* (0.07)
<b>B. Controlling for Social Spending</b>						
$\log 1 - \tau(L)$	0.71*** (0.16)	0.51*** (0.16)	0.33*** (0.07)	0.20 (0.17)	0.30** (0.14)	1.05** (0.41)
Log GDP Per Adult	0.07** (0.03)	0.08*** (0.02)	0.06*** (0.02)	0.03 (0.02)	0.06*** (0.02)	0.13** (0.07)
Social Spending	-0.033*** (0.011)	-0.025** (0.011)	-0.021*** (0.006)	-0.003 (0.008)	-0.031*** (0.010)	-0.008 (0.018)
<b>C. Controlling for Social Spending and Regulations</b>						
$\log 1 - \tau(L)$	0.27 (0.18)	0.09 (0.17)	0.18 (0.13)	-0.05 (0.17)	-0.09 (0.17)	0.43 (0.42)
Log GDP Per Adult	0.05* (0.03)	0.07*** (0.02)	0.05*** (0.02)	0.02 (0.02)	0.05** (0.02)	0.11 (0.07)
Social Spending	-0.030*** (0.010)	-0.022** (0.010)	-0.020*** (0.005)	-0.001 (0.008)	-0.029*** (0.009)	-0.004 (0.019)
Effective Regulations Index	-0.32** (0.13)	-0.30** (0.13)	-0.11* (0.06)	-0.18* (0.10)	-0.28** (0.13)	-0.45* (0.26)
N	138	138	138	138	138	138
Adjusted $R^2$	0.63	0.54	0.60	0.52	0.60	0.63

*Notes.* This table reports elasticities of prime-age hours worked with  $1 - \tau_L$  across countries.  $\tau_L$  is the effective average tax on labor income in the country from Bachas et al. (2026). Panel A controls for log GDP per adult and the Muslim/Hindu population share. Panel B further controls for social spending, expressed as a percent of GDP so that the coefficient captures the effect of one extra GDP point on log hours. Panel C further controls for the effective labor regulations index in addition to social spending. For each country with data (see Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The sample in all panels covers 138 countries (96% of the world adult population) for which all variables are available. Social spending includes all cash and quasi-cash transfers to individuals but excludes public pensions as we focus on prime-age adults (aged 20-59). The Effective Regulations Index is the product of a labor regulations index (from 0 to 1) and the share of workers in the formal sector (as regulations generally only apply to the formal sector). The labor regulation index is constructed by combining 12 variables on working hours regulations from the World Bank [Employing Workers](#) database. All regressions are weighted by adult population size in each country to be representative. Unweighted regressions are presented in Appendix Table B7.

Figure 1: Global Hours Worked by Age and Gender



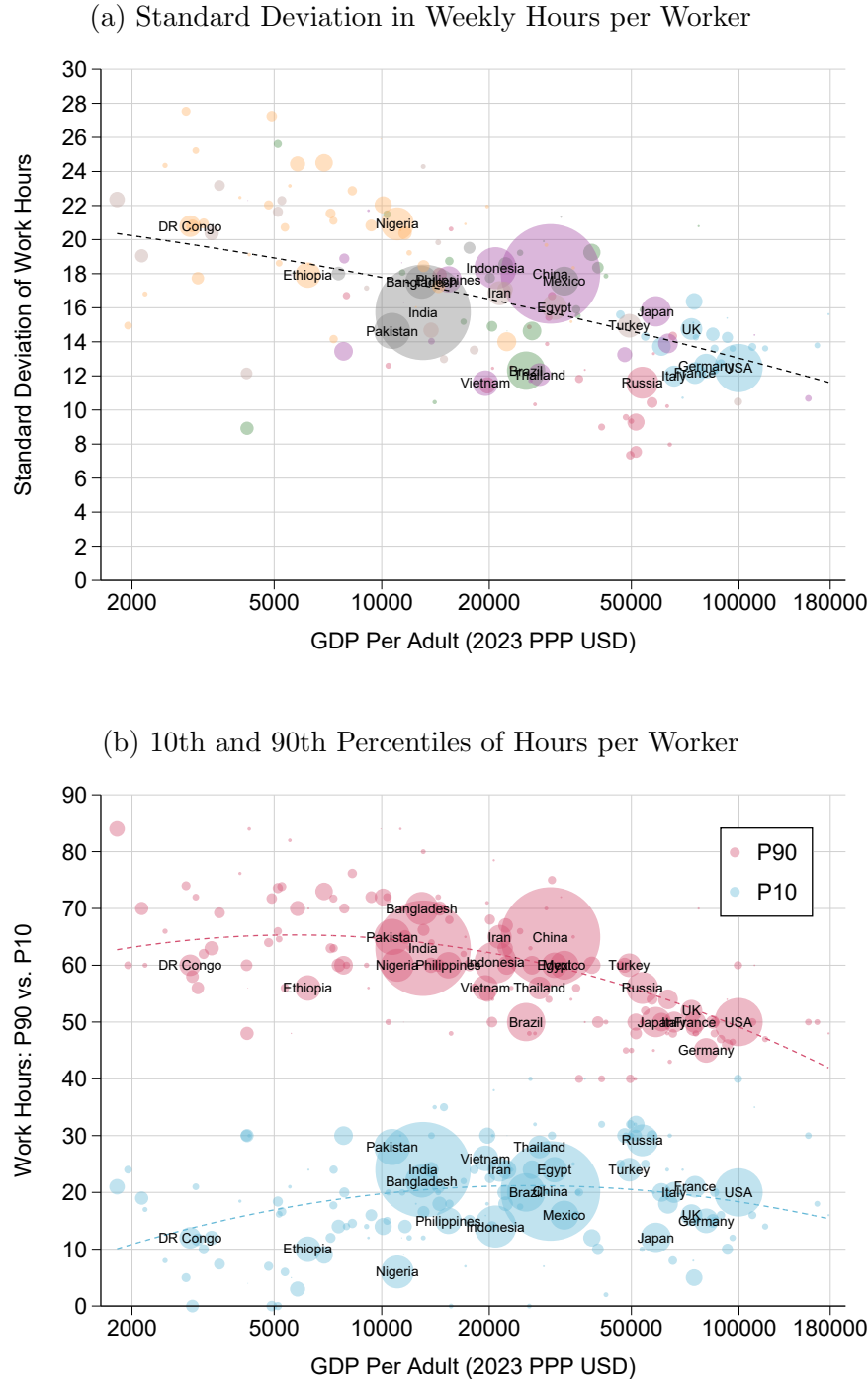
*Notes:* The figure depicts global average weekly hours of work per adult (aged 15 and above) in panel (a), employment rates per adult in panel (b), and weekly hours of work per worker in panel (c) by gender and 5-year age groups 15-19, 20-24, ..., 60-64, and grouping together those aged 65+. Panel (d) depicts the world distribution of weekly hours worked among workers (aged 15+). For each country with data (see Appendix Figure A1), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Estimates are weighted by adult population size in each country to be representative. The sample covers 97% of the world adult population. Hours of work are defined in almost all countries as actual hours of work (rather than usual) in the reference week across all jobs, including self-employment that contributes to GDP (non-market home produced services such as cleaning, cooking, and childcare are excluded). The employment rate is the fraction of the population having a job (including those on vacation or sick leave). Therefore, unconditional hours in panel (a) decompose into the product of employment rates in panel (b) and hours per worker in panel (c). Hours of work are lower among the young, the elderly, and women and this result is driven primarily by employment rates. Panel (d) shows that there are spikes in weekly hours of work, corresponding to social norms or regulations about normal hours per day and number of days off each week.

Figure 2: Hours Worked among All Adults (Aged 15+) by Country



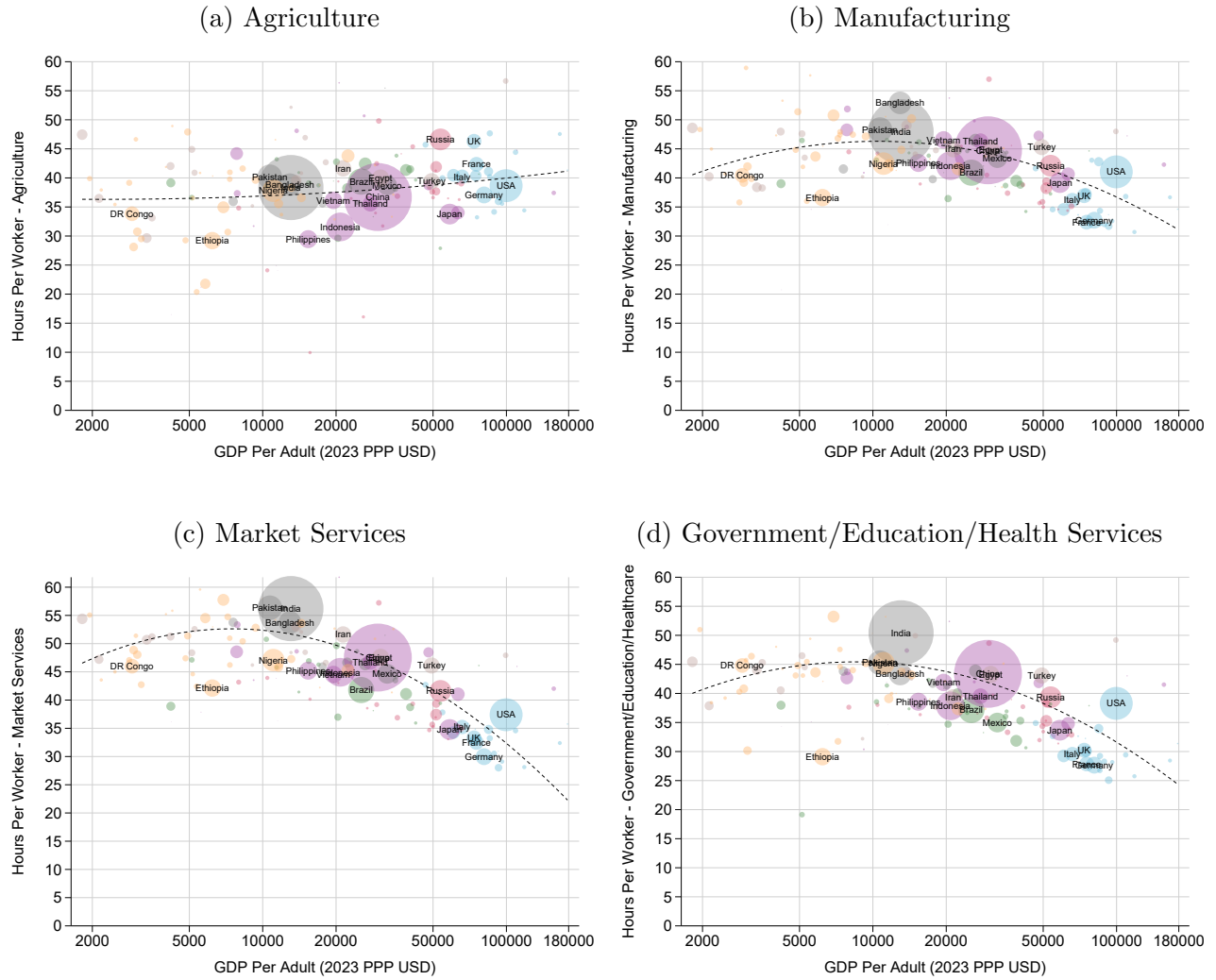
*Notes:* The figure depicts average weekly hours of work per adult (aged 15+) in panel (a), employment rates per adult in panel (b), and weekly hours of work per worker in panel (c) against log GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country’s circle is proportional to its adult population; the largest countries’ names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows that hours of work per adult are weakly correlated with development overall. Panel (b) shows overall stability of the employment rate with development and panel (c) shows a bell-shaped pattern in hours per worker, with a substantial decline for higher income countries.

Figure 3: Variance in Hours Worked per Worker within Countries



*Notes:* The figure depicts the standard deviation in weekly hours of work per worker in panel (a), and the 10th and 90th percentiles (P10 and P90) of weekly hours of work per worker in panel (b) against log GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors in panel (a) correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows a clear decline in the standard deviation of hours of work per worker with development. Panel (b) also shows a clear decline in the gap between the 90th and 10th percentiles of hours with the 90th percentile falling sharply in richer countries and the 10th percentile increasing in poorer countries.

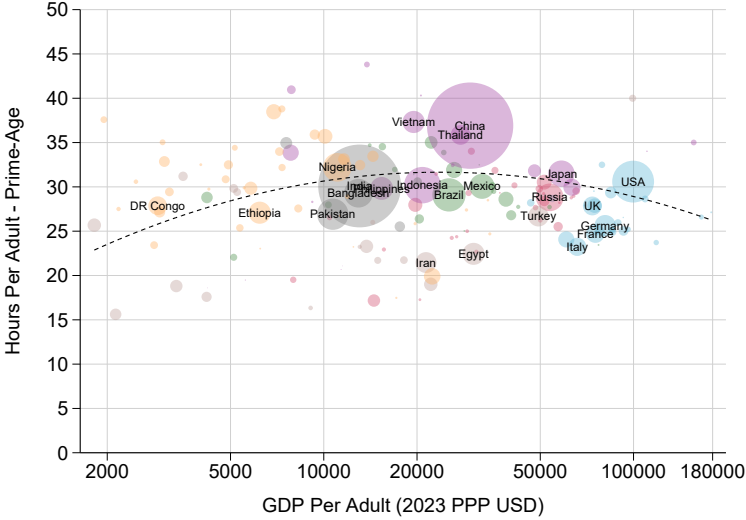
Figure 4: Hours Worked per Worker by Country and Industry



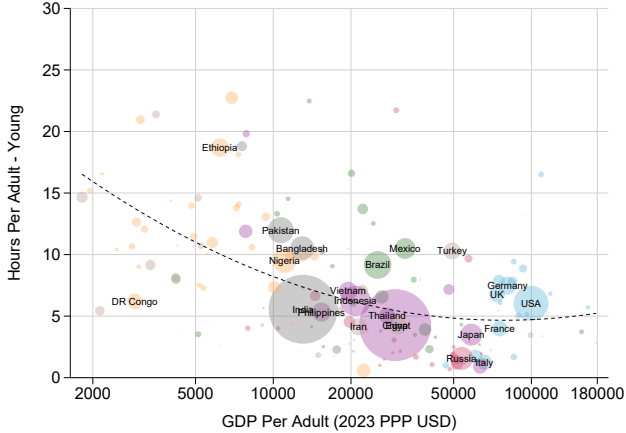
*Notes:* The figure depicts average weekly hours of work per worker by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows that hours per worker in agriculture are stable with GDP per adult at around 40. Panels (b)-(d) show that hours per worker in manufacturing, market services, and government/education/health services first increase slightly and then decrease sharply with GDP per adult. Hours per worker are highest in middle-income countries and in market services and manufacturing.

Figure 5: Hours Worked per Adult by Country and Age Group

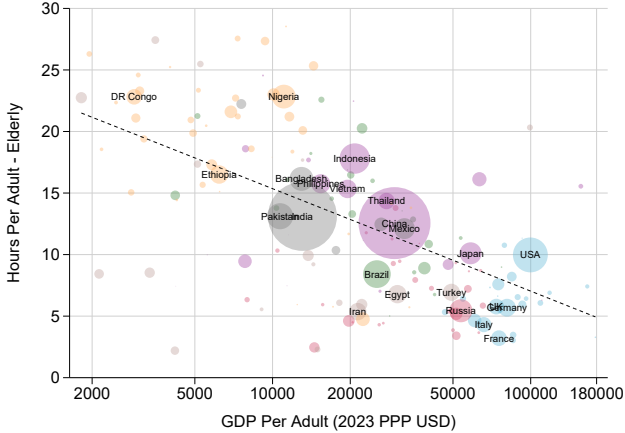
(a) Prime-Age Adults (Aged 20-59)



(b) Young (Aged 15-19)



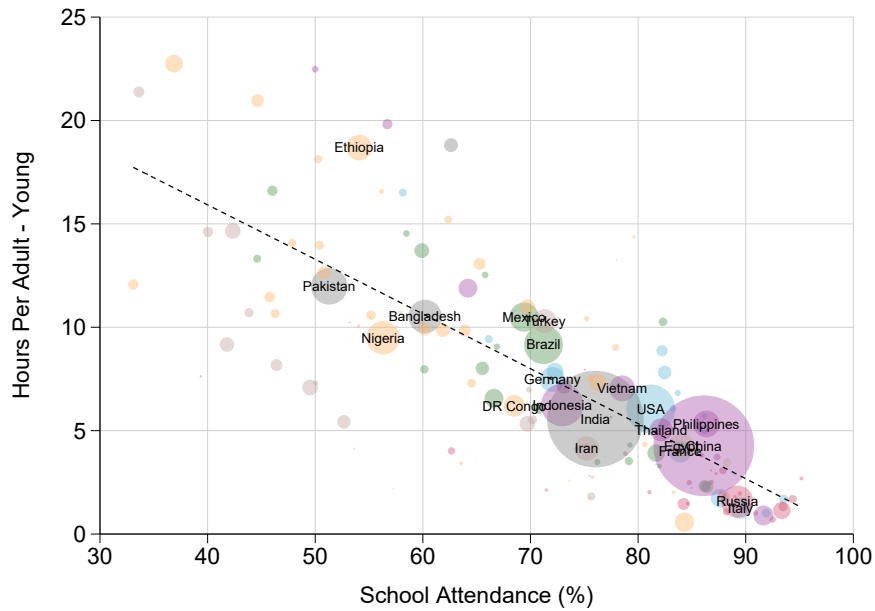
(c) Elderly (Aged 60+)



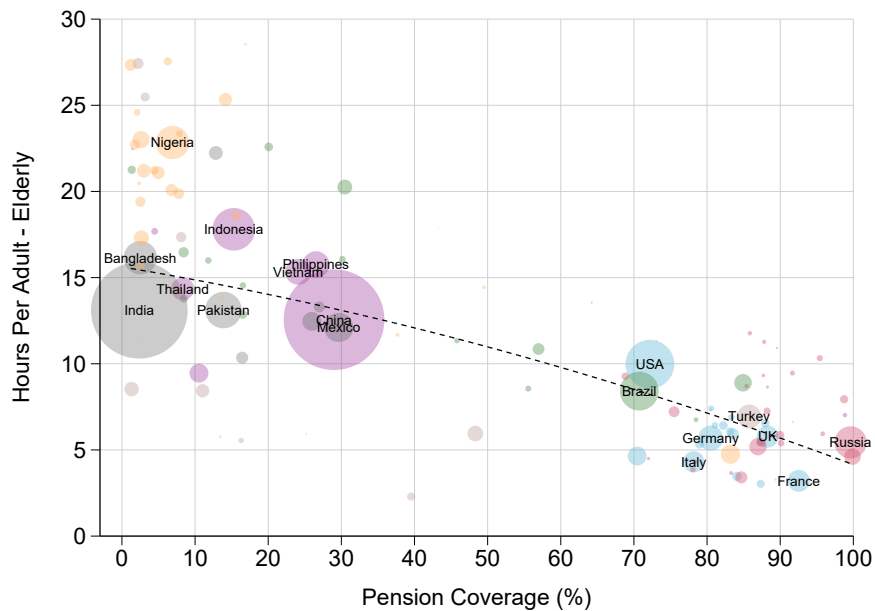
Notes: The figure depicts average weekly hours of work per adult for prime-age adults (aged 20-59) in panel (a), for the young (aged 15-19) in panel (b), and for the elderly (aged 60+) in panel (c) by country ranked by GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country’s circle is proportional to its adult population; the largest countries’ names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows that prime-age hours worked are relatively stable with development. Panel (b) shows a moderate decline in hours worked by the young. Panel (c) shows a strong decline in hours worked by the elderly.

Figure 6: Schooling, Pensions, and Hours Worked by the Young and the Elderly

(a) School Attendance and Hours Worked by the Young (15-19)



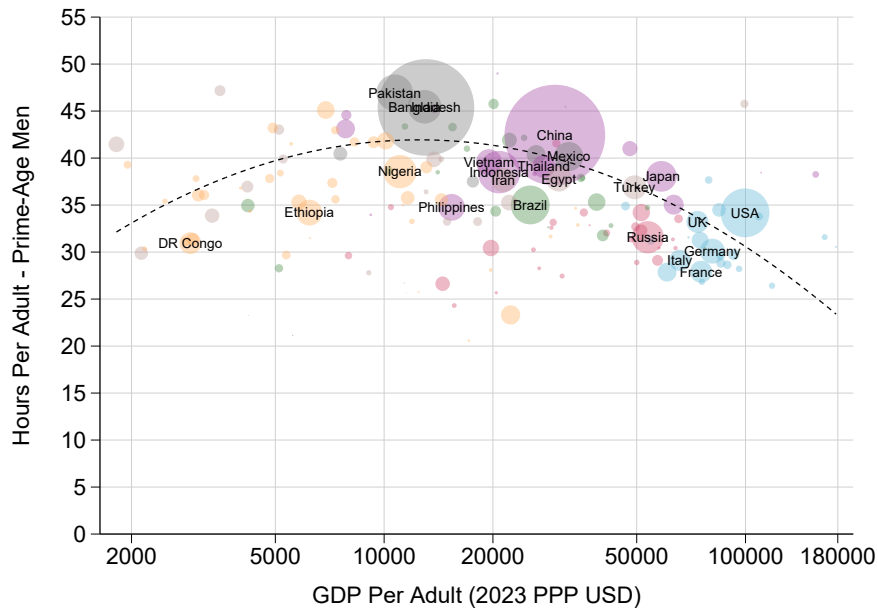
(b) Pension Coverage and Hours Worked by the Elderly (60+)



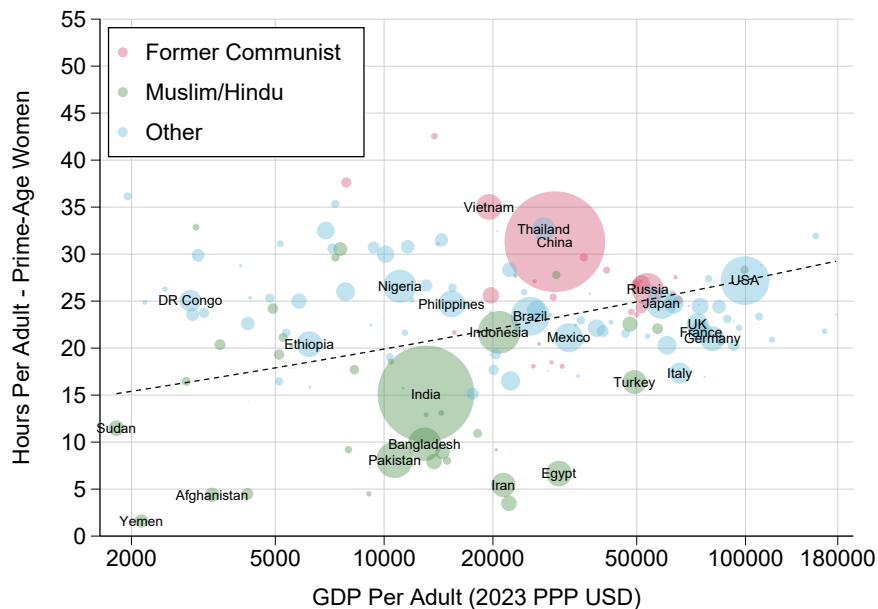
*Notes:* Panel (a) depicts the correlation between school attendance and hours of work among the young (aged 15-19). Panel (b) depicts the correlation between public pension coverage and hours of work among the elderly (aged 60+). Pension coverage is defined as the fraction of adults aged 60+ living in a household where at least one person receives a public pension and the household public pension amount equals at least 10% of GDP per adult in the country. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Each country's circle's area is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows a strong negative correlation between school attendance and hours of work of the young across countries (see Table 3 for regression results). Panel (b) shows a strong negative correlation between pension coverage and hours of work of the elderly across countries (see Table 4 for regression results).

Figure 7: Hours Worked per Adult by Country: Prime-Age Men and Women

(a) Men (Aged 20-59)



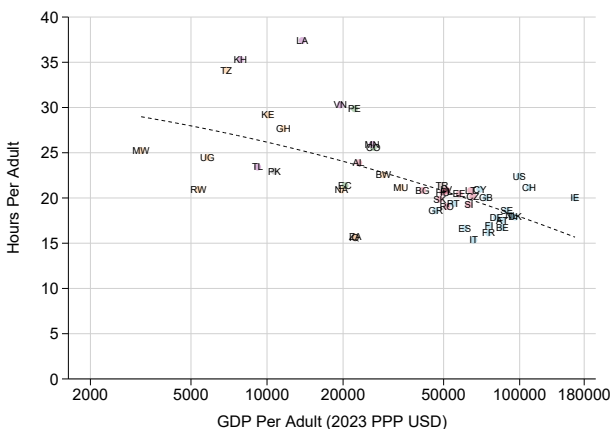
(b) Women (Aged 20-59)



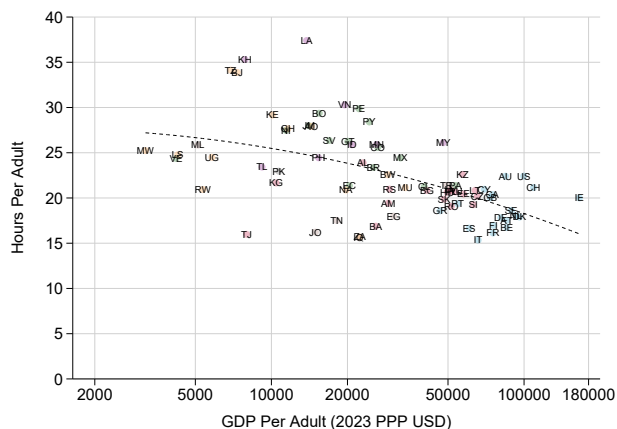
*Notes:* The figure depicts average weekly hours of work per adult for prime-age men in panel (a), and prime-age women in panel (b), against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. In panel (a), colors correspond to world regions as depicted in Figure A1. In panel (b), colors group countries into three groups most relevant for female hours worked: former communist countries in red, Muslim/Hindu countries in green, and other countries in blue. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows a pronounced bell-shaped pattern of male prime-age hours of work with development. Panel (b) shows a strong increase in female hours of work with development, with particularly low hours among Muslim/Hindu countries (in green) and high hours among former communist countries (in red). If we exclude Muslim/Hindu countries, there is no relationship between GDP per adult and female prime-age hours worked (see Appendix Figure A12(a)).

Figure 8: Comparison with Bick, Fuchs-Schündeln, and Lagakos (2018)

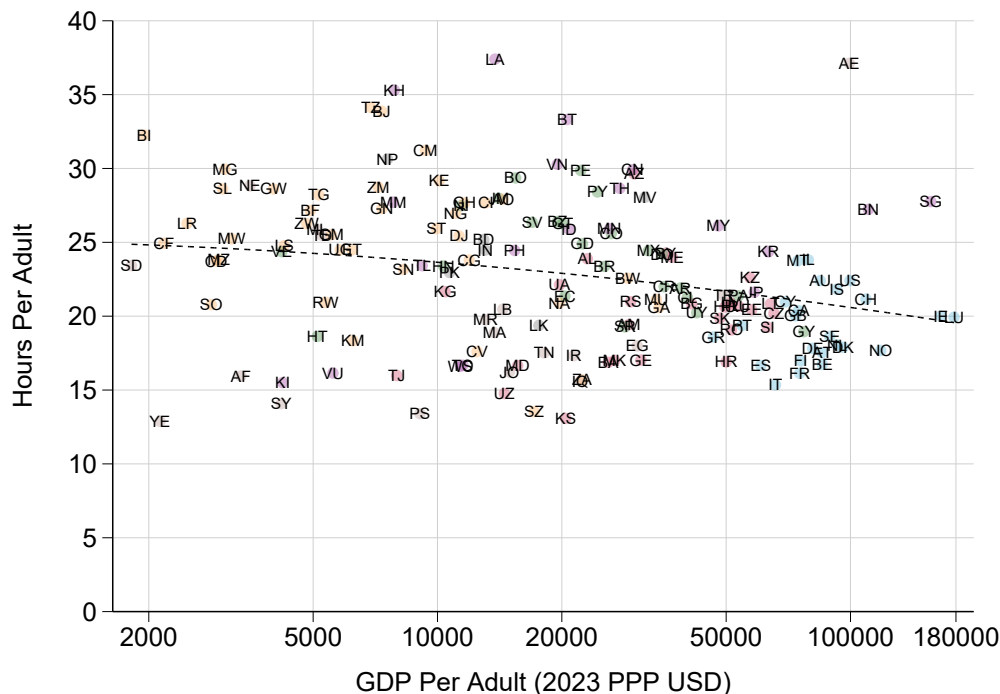
(a) Bick et al. (2018) Core Sample



(b) Bick et al. (2018) Full Sample



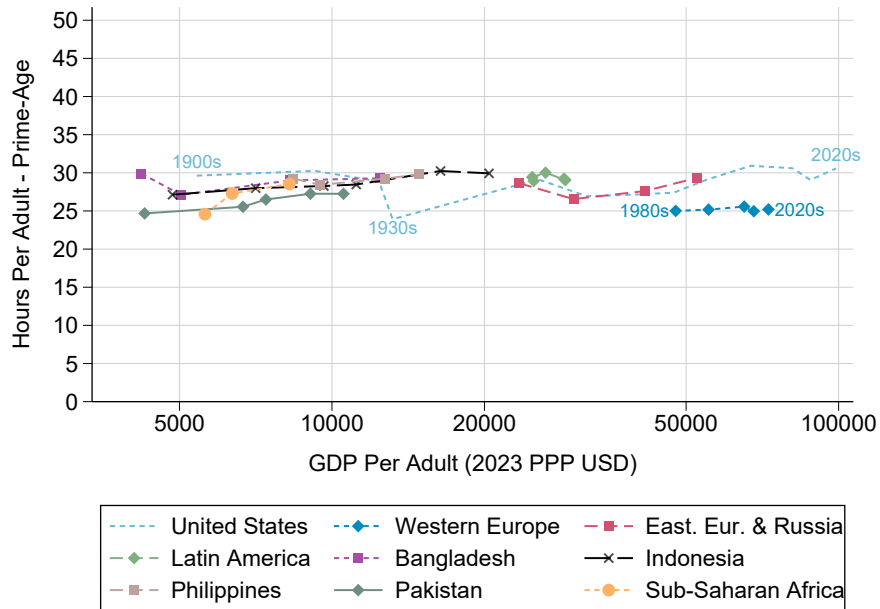
(c) Our Sample



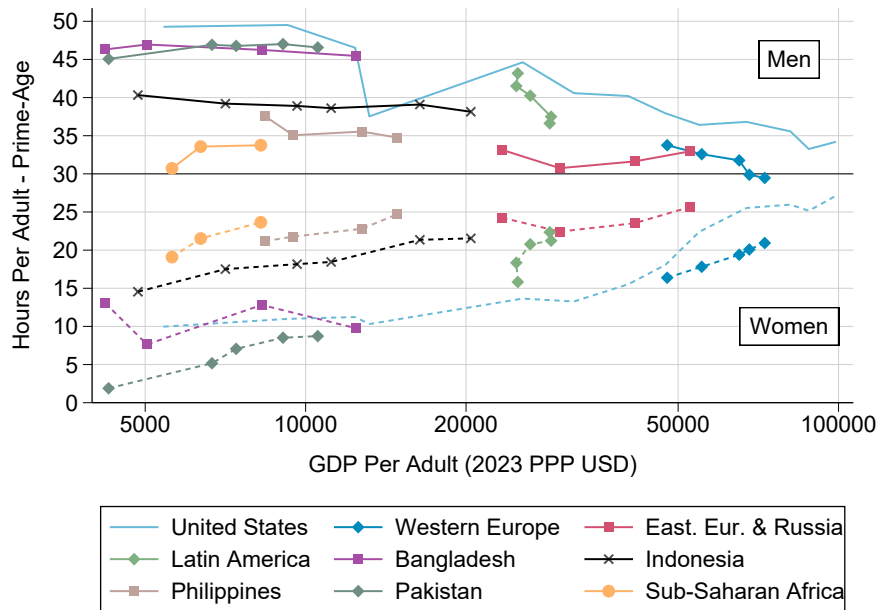
*Notes:* The figure compares weekly hours per adult over the course of development in the sample of countries studied by Bick, Fuchs-Schündeln, and Lagakos (2018) using our database on global hours worked. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Panel (a) plots hours per adult against GDP per adult in our database when restricting the analysis to the 49 core countries studied by Bick, Fuchs-Schündeln, and Lagakos (2018). Panel (b) does the same for the 80 countries in their full sample (excluding Taiwan, which is not covered in our database). We use our own estimates of hours worked in the most recent year available (excluding COVID years) in both panels (a) and (b). Panel (c) extends the analysis to all 160 countries in our database. The best quadratic fit of the *unweighted* observations is represented by the dashed curve. Corresponding elasticities are reported in Table 6, Panel A. Extending the analysis from the 80 countries covered in Bick, Fuchs-Schündeln, and Lagakos (2018) to the 160 countries covered in this paper reduces the negative relationship between log GDP per adult and hours of work per adult. There is considerable heterogeneity in hours worked at all levels of development.

Figure 9: Evolution of Hours Worked: Prime-Age Adults

(a) All Prime-Age Adults (Aged 20-59)



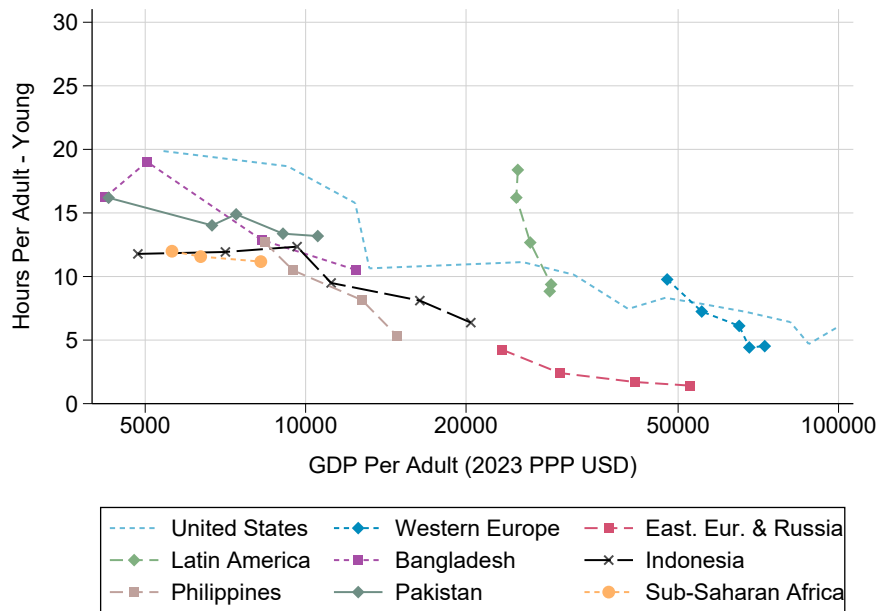
(b) Men vs. Women (Aged 20-59)



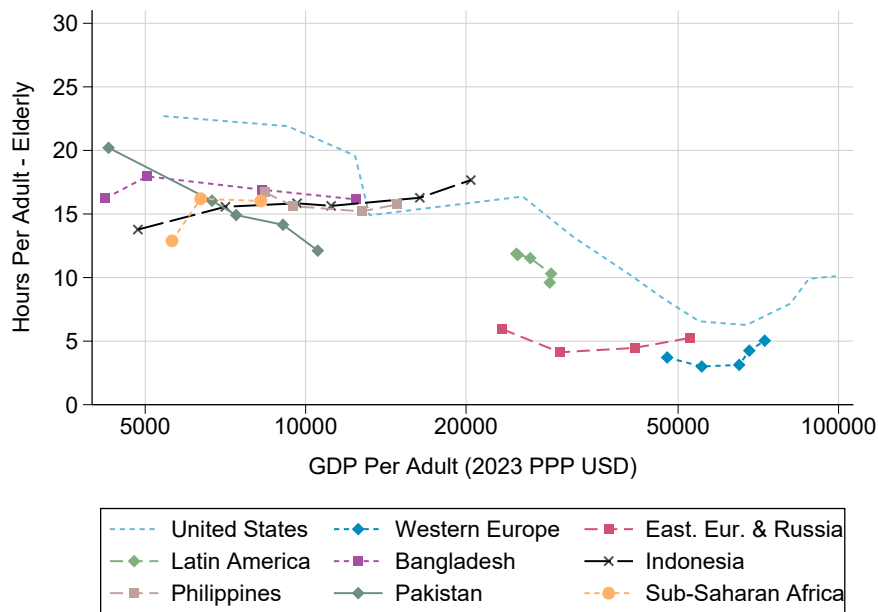
*Notes:* The figure depicts the evolution by decade of hours worked by prime-age adults (aged 20-59) in panel (a), and prime-age men and prime-age women in panel (b), for a selection of regions and countries for which we have long time series available. Hours are plotted against country or region GDP per adult in the corresponding decade (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. The long time series for the United States combines Current Population Survey data since 1962 with Ramey and Francis (2009) data for 1900-1959. Panel (a) shows striking stability of prime-age hours of work over time in each region/country. Panel (b) shows that hours of work generally increase for women, while they symmetrically decrease for men, explaining the stability in panel (a). Appendix Figure A17 shows that the decline in male hours is driven by the intensive margin while the increase in female hours is driven by the extensive margin.

Figure 10: Evolution of Hours Worked: Young and Elderly

(a) Young (Aged 15-19)



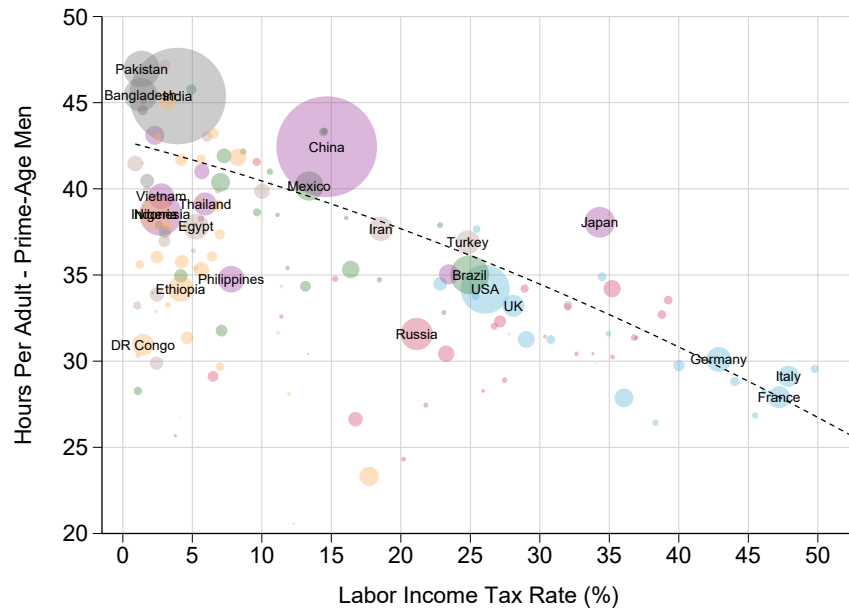
(b) Elderly (Aged 60+)



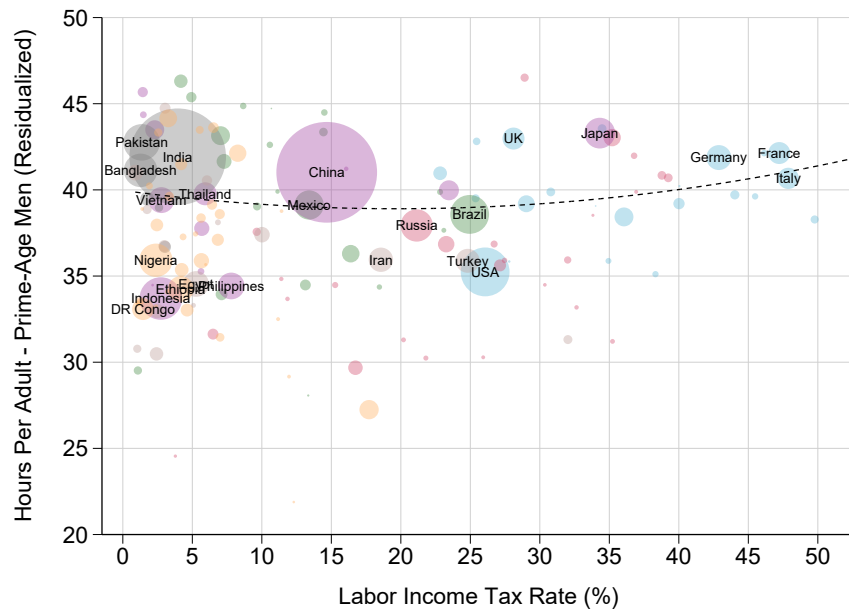
*Notes:* The figure depicts the evolution by decade of average weekly hours of work per adult for the young (aged 15-19) in panel (a), and for the elderly (aged 60+) in panel (b), for a selection of regions and countries for which we have long time series available. Hours are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. The long time series for the United States combines Current Population Survey data since 1962 with Ramey and Francis (2009) data for 1900-1959. Panel (a) shows almost universal and often large declines in hours of work of the young over time within regions/countries. In contrast, panel (b) shows general stability in hours of work of the elderly over time within regions/countries (except for the U.S. long time series, which shows a steep decline over 1900-1960).

Figure 11: Labor Taxes and Hours Worked among Prime-Age Men

(a) Unconditional



(b) Conditional on Social Spending and Regulations



*Notes:* The figure depicts the correlation between average labor tax rates and hours of work among prime-age men in panel (a) and the same correlation after conditioning on effective regulations and social spending in panel (b). In each panel, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. In panel (b), prime-age male hours are residualized by regressing them on the effective regulations index and social expenditure, computing the residual, and adding the cross-country average of hours worked to this residual. The best quadratic fit of the weighted circles is represented by the dashed curve in each panel. Average labor tax rates are from Bachas et al. (2026). Panel (a) shows a strong negative correlation between labor tax rates and hours of work of prime-age men across countries. Panel (b) shows that this correlation drops to zero when conditioning on social transfers relative to GDP (excluding pensions) and the effective labor regulations index.

# SUPPLEMENTARY ONLINE APPENDIX

## Contents

[Appendix A. Additional Main Figures and Tables](#)

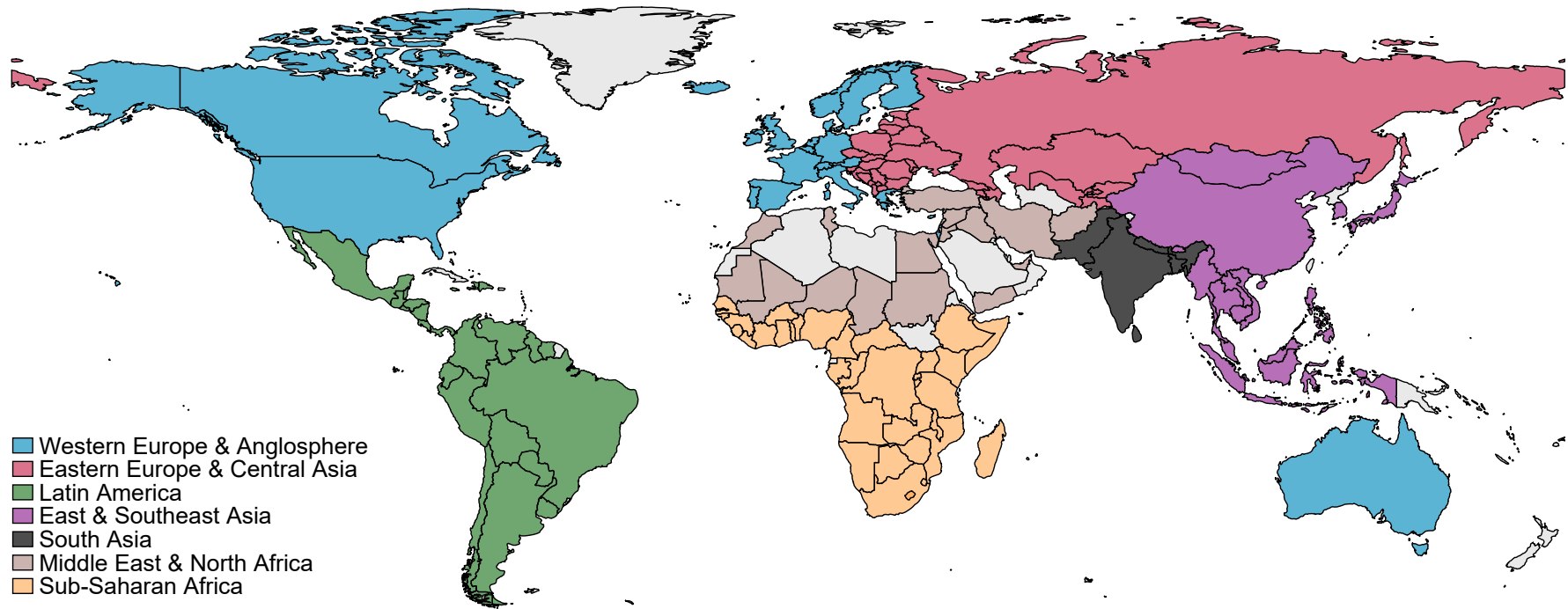
[Appendix B. Regression Results without Population Weights](#)

[Appendix C. Additional Methodological Details](#)

[Appendix D. Labor Supply Model](#)

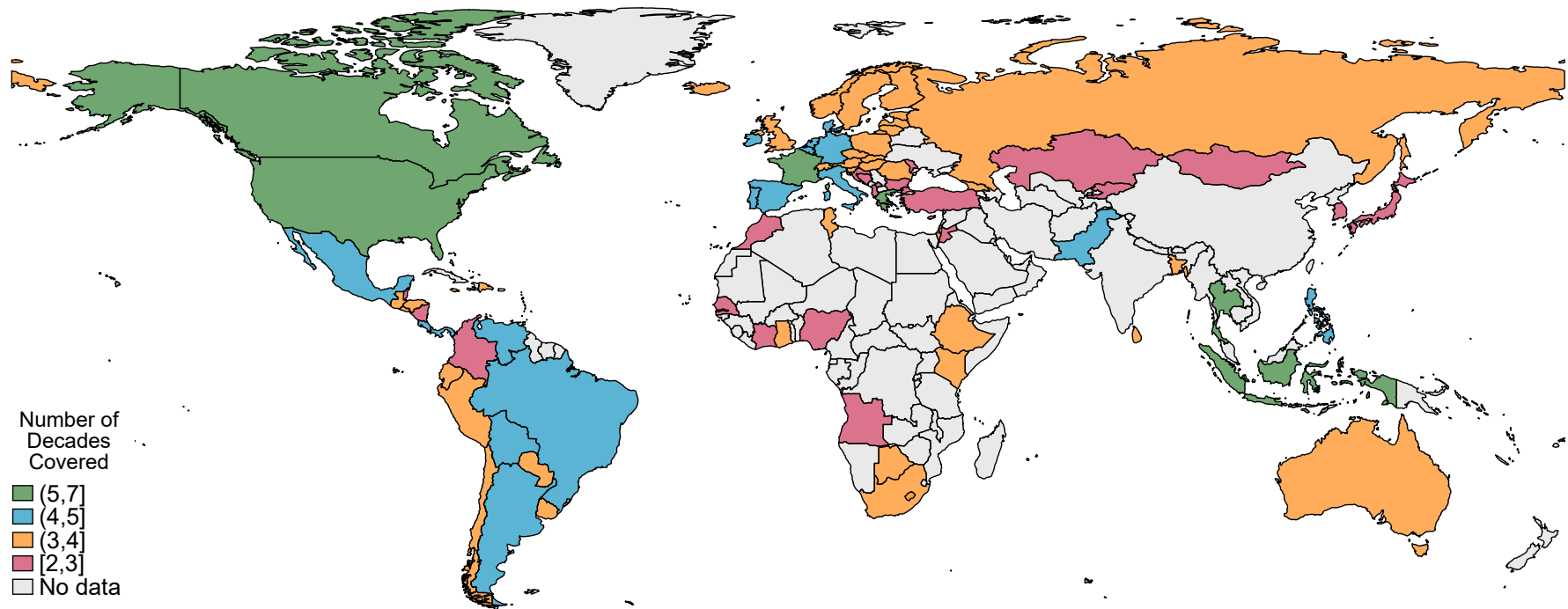
## Appendix A. Additional Main Figures and Tables

Figure A1: Data Coverage and World Regions



*Notes:* The figure depicts all the countries for which recent hours worked survey data are available for our analysis as well as the regional breakdown that we will use. Relative to the usual partition of countries by region, the Middle East and North Africa region is expanded to include Saharan/Sahel countries (Chad, Niger, Mali, Mauritania), which are Muslim-majority and similar to North African countries in their patterns of hours worked. Our data cover 97% of the world population. Countries with no data are colored in light grey. By adult population size in 2024, the largest missing territories are Algeria (32m), Saudi Arabia (27m), North Korea (22m), Taiwan (21m), Cuba (9m), Papua New Guinea (7m), Hong Kong (7m), and South Sudan (6m).

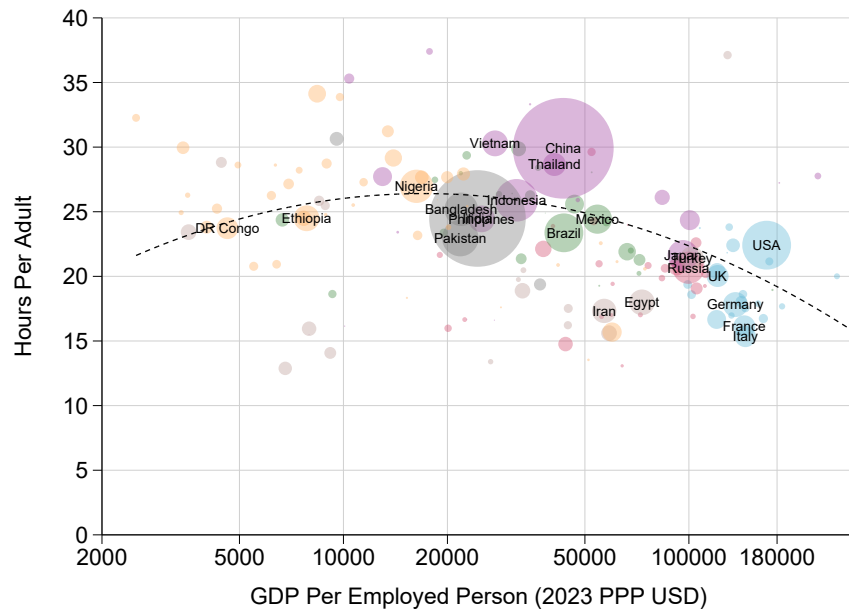
Figure A2: Data Coverage of Panel Database



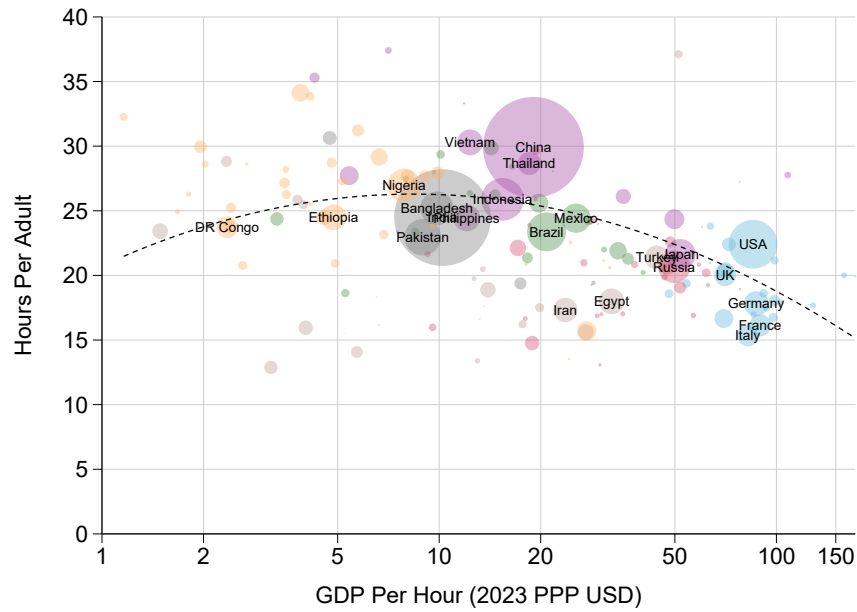
*Notes:* The figure depicts all the countries for which time series of hours worked spanning at least two decades are available for our analysis as well as the number of decades covered in each of these countries.

Figure A3: Hours Worked among All Adults by Country Income (GDP per Worker/per Hour)

(a) Hours Worked and GDP per Worker

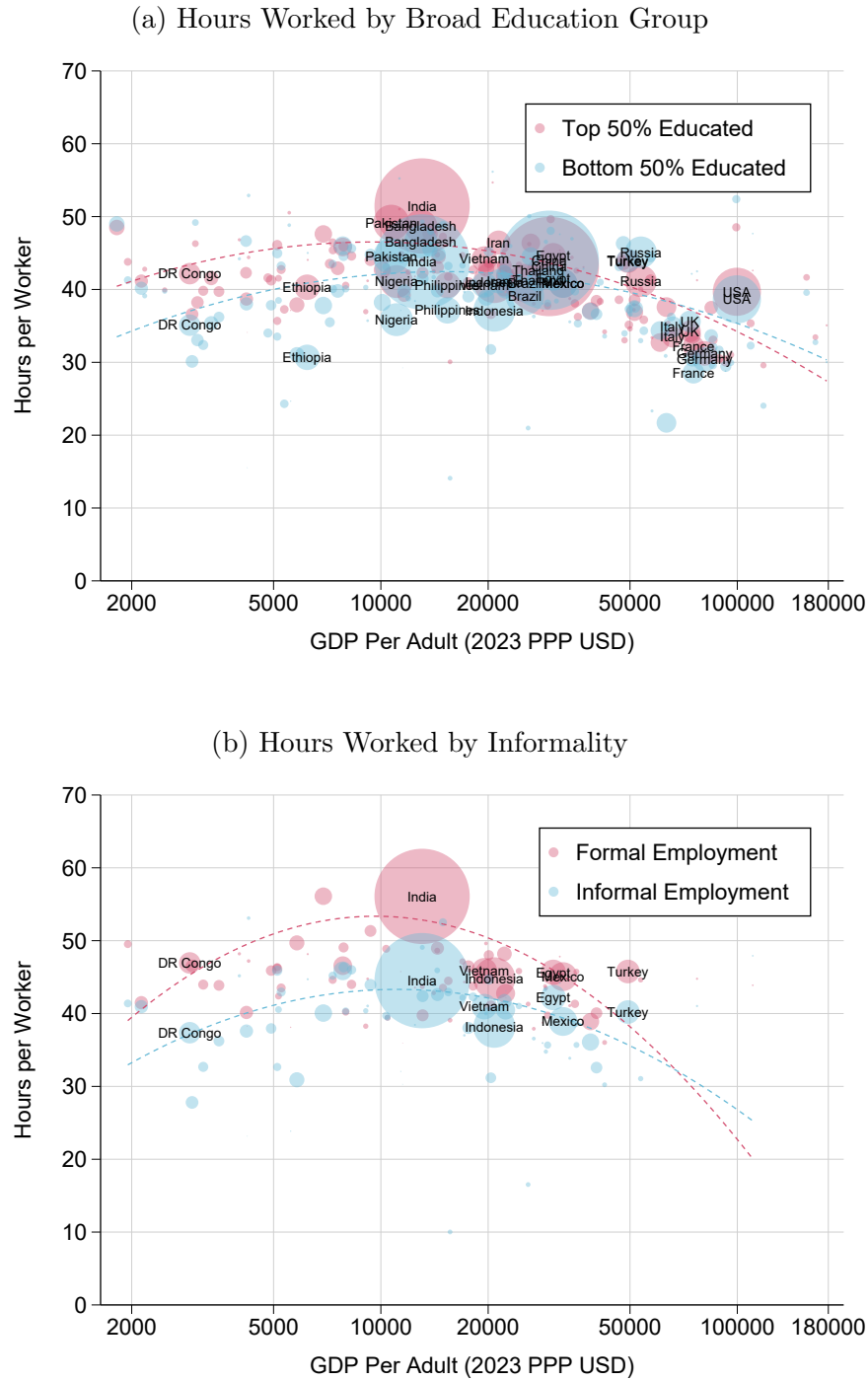


(b) Hours Worked and GDP per Hour



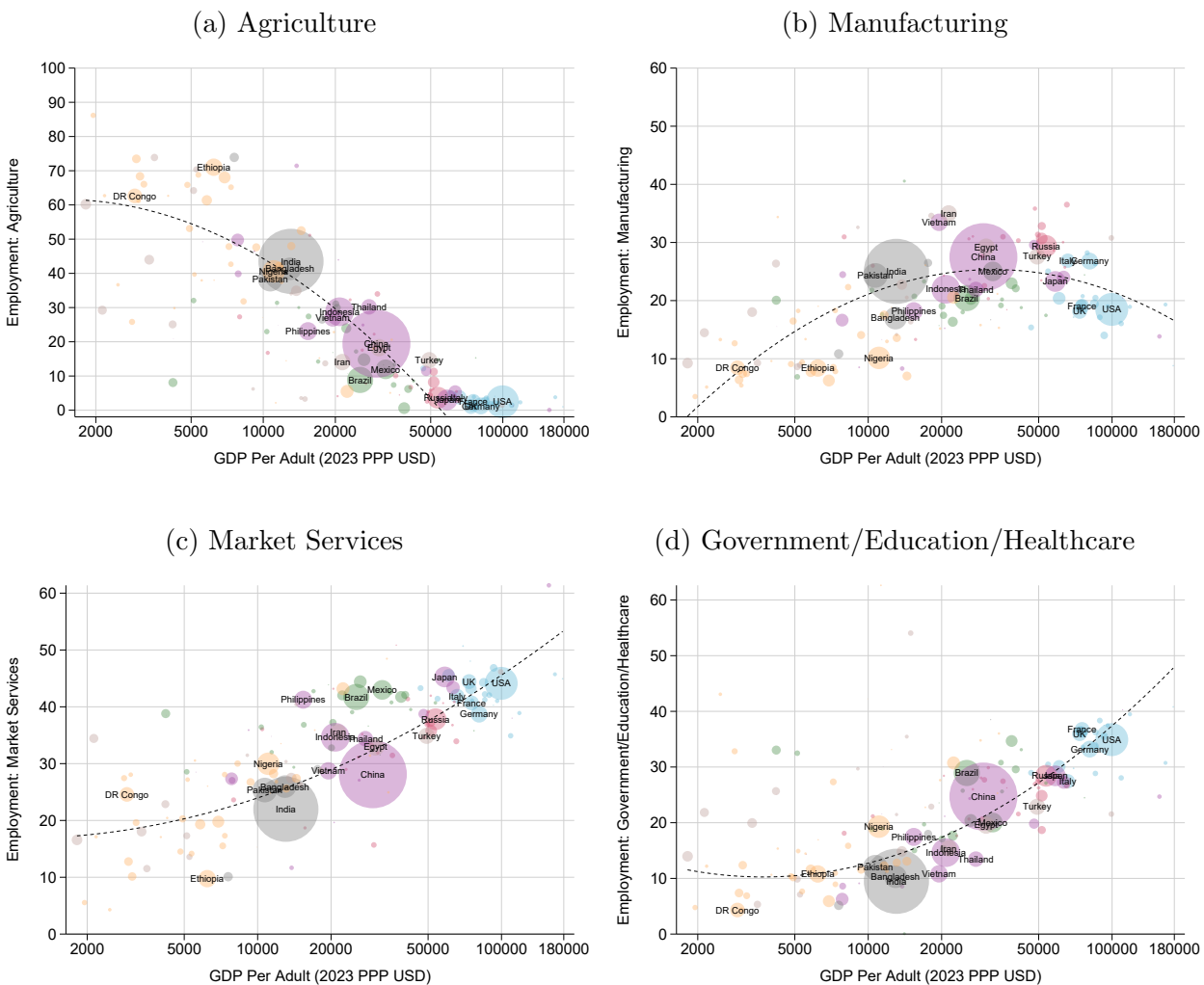
*Notes:* The figure reproduces Figure 2, panel (a) but replacing the x-axis with GDP per employed person (panel (a)) and GDP per hour (panel (b)) instead of GDP per adult in Figure 2(a). In both panels, the main pattern of hours worked over the course of development is very similar to the one depicted in Figure 2, panel (a).

Figure A4: Hours per Worker by Education and Informality



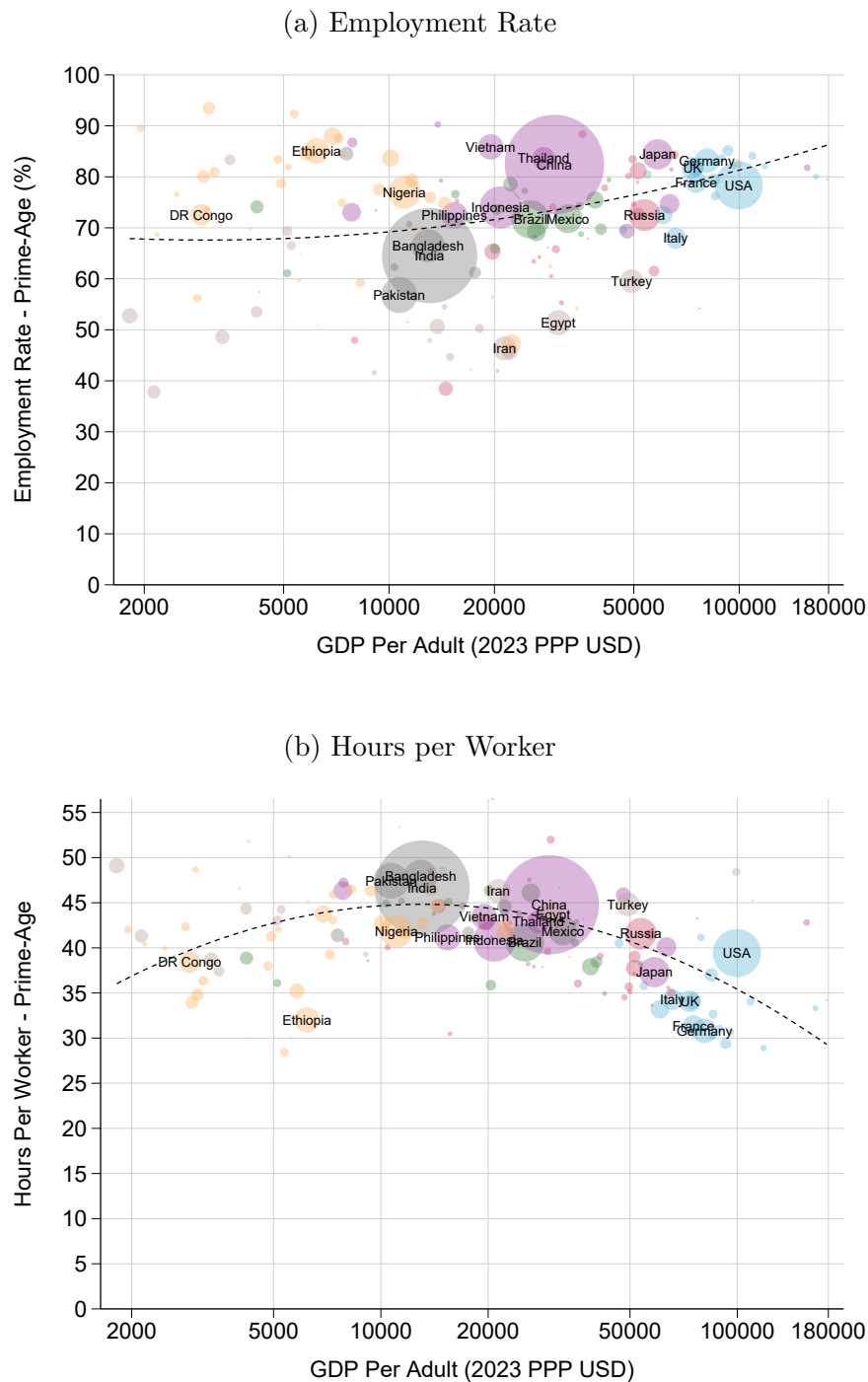
*Notes:* The figure depicts average hours conditional on being employed among the 50% most educated workers and the 50% least educated workers in each country (panel (a)) and among workers in formal and informal employment (panel (b)) against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. The best quadratic fit of the weighted circles is represented by the dashed curves. Higher-educated workers tend to work longer hours than lower-educated workers, especially in low-income and lower-middle-income countries (panel (a)). There are some countries where the opposite is true, however, such as China, Russia, and Italy. In almost all countries, workers tend to work longer hours in the formal sector than in the informal sector (panel (b)).

Figure A5: Employment by Sector Over the Course of Development



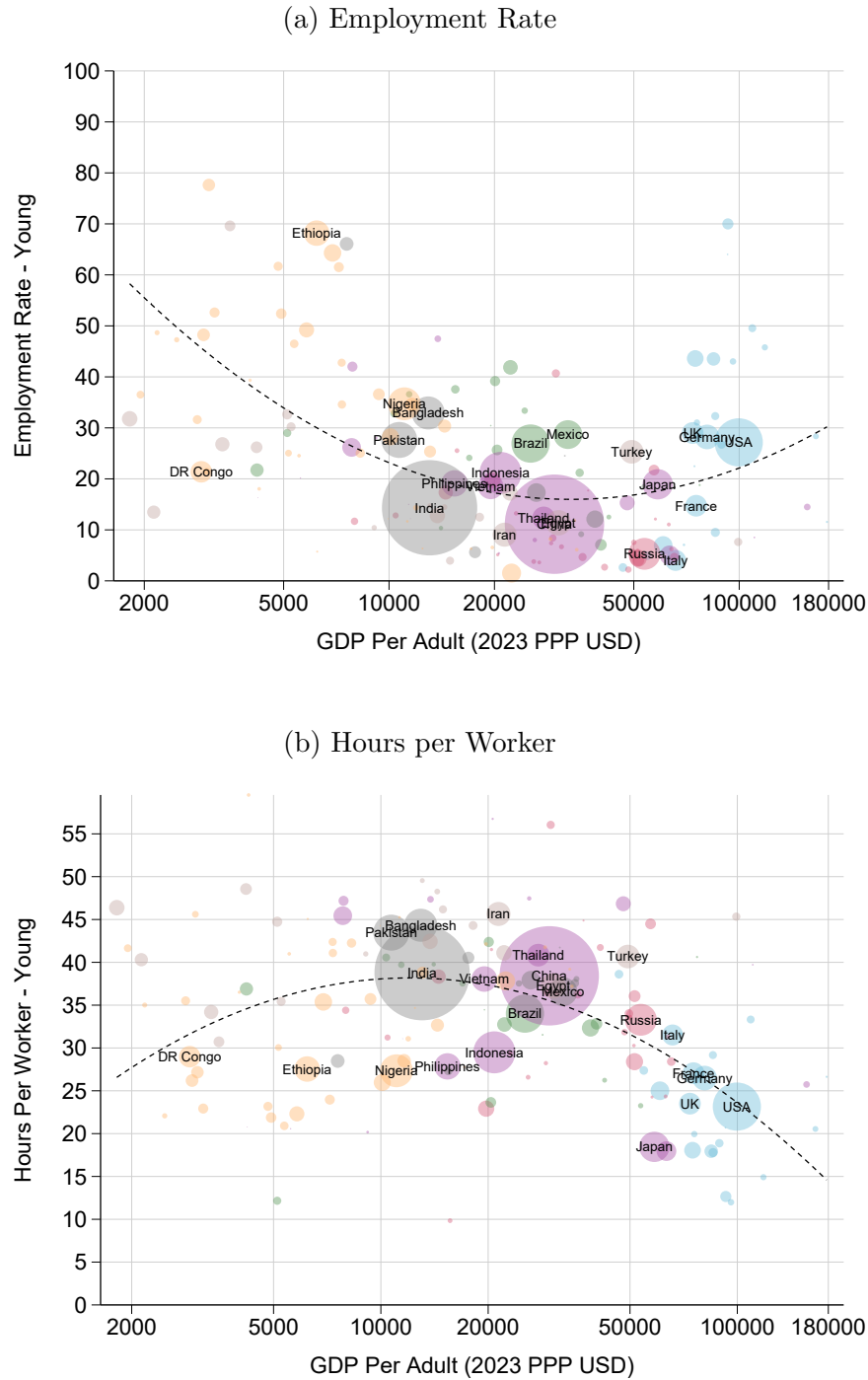
*Notes:* The figure depicts employment shares among adult workers by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows that the share of workers in agriculture falls sharply with development. Panel (b) shows that the share of workers in manufacturing first increases and then decreases with development. Panels (c) and (d) show that the shares of workers in market services and government services increase with development.

Figure A6: Hours Worked among Prime-Age Adults: Extensive vs. Intensive Margins



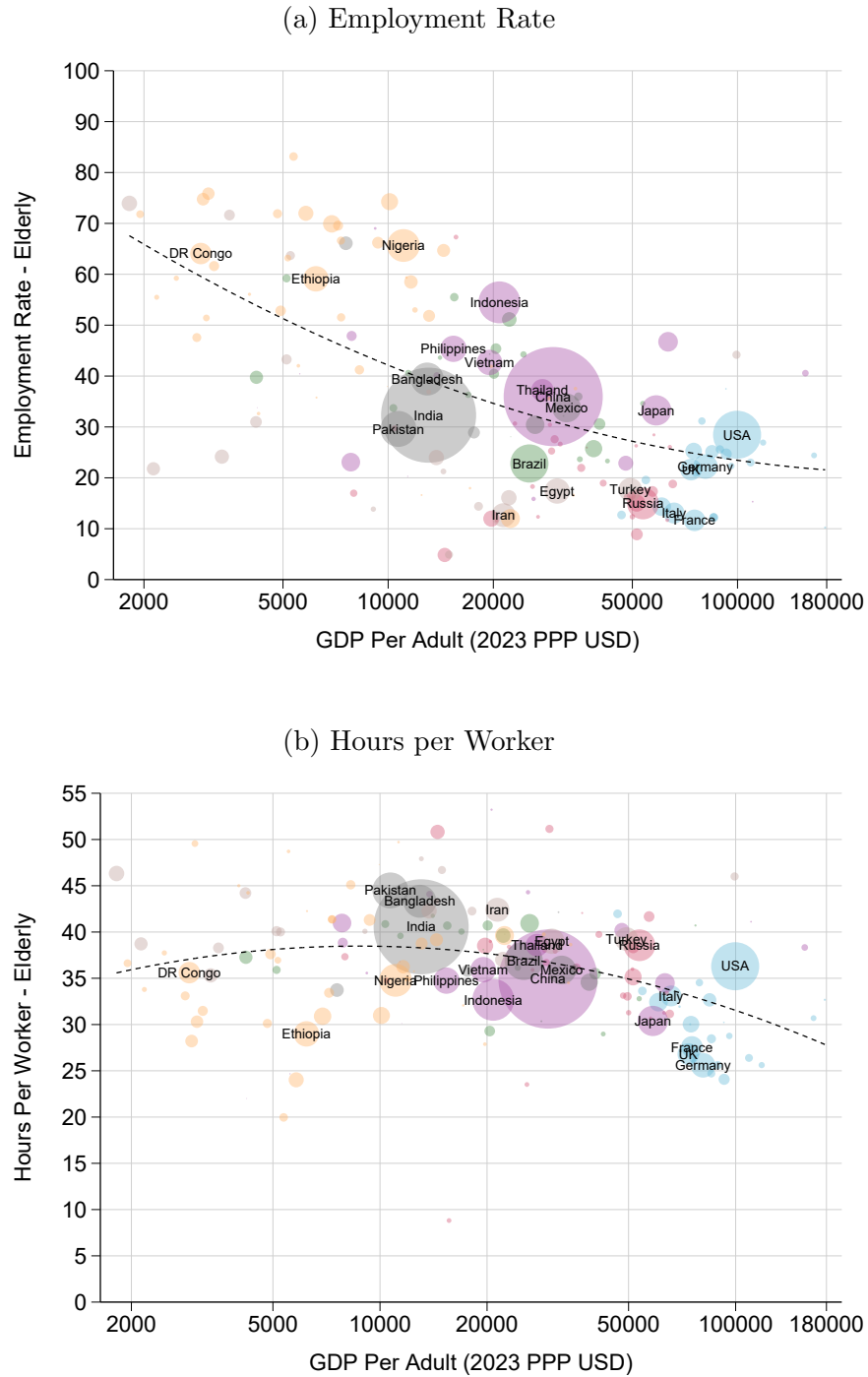
*Notes:* The figure depicts average hours worked among prime-age adults (aged 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 5(a) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. The employment rate of prime-age adults increases with development while hours per worker are bell-shaped with development.

Figure A7: Hours Worked among Young Adults: Extensive vs. Intensive Margins



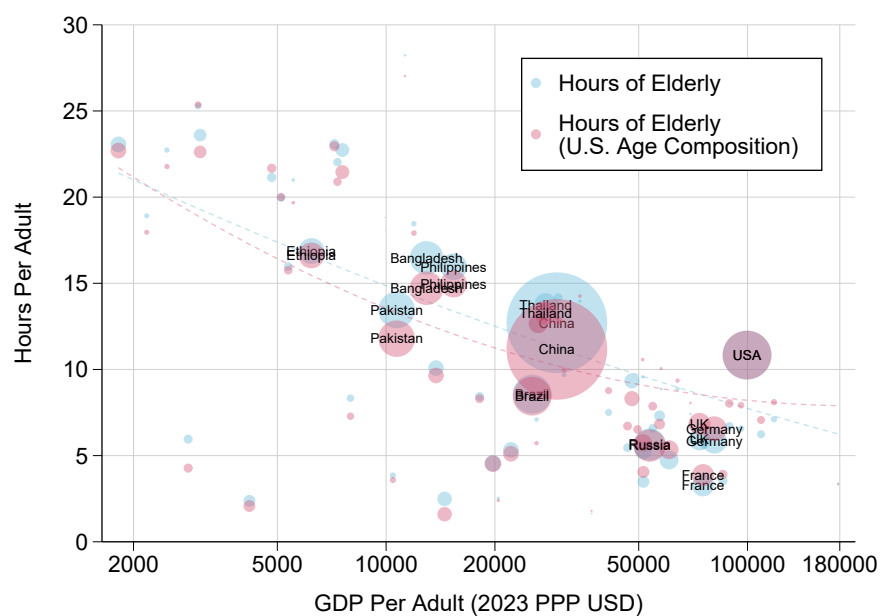
*Notes:* The figure depicts average hours worked among the young (aged 15-19) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 5(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. The employment rate of young adults is slightly U-shaped with development while hours per worker are bell-shaped with development.

Figure A8: Hours Worked among the Elderly: Extensive vs. Intensive Margins



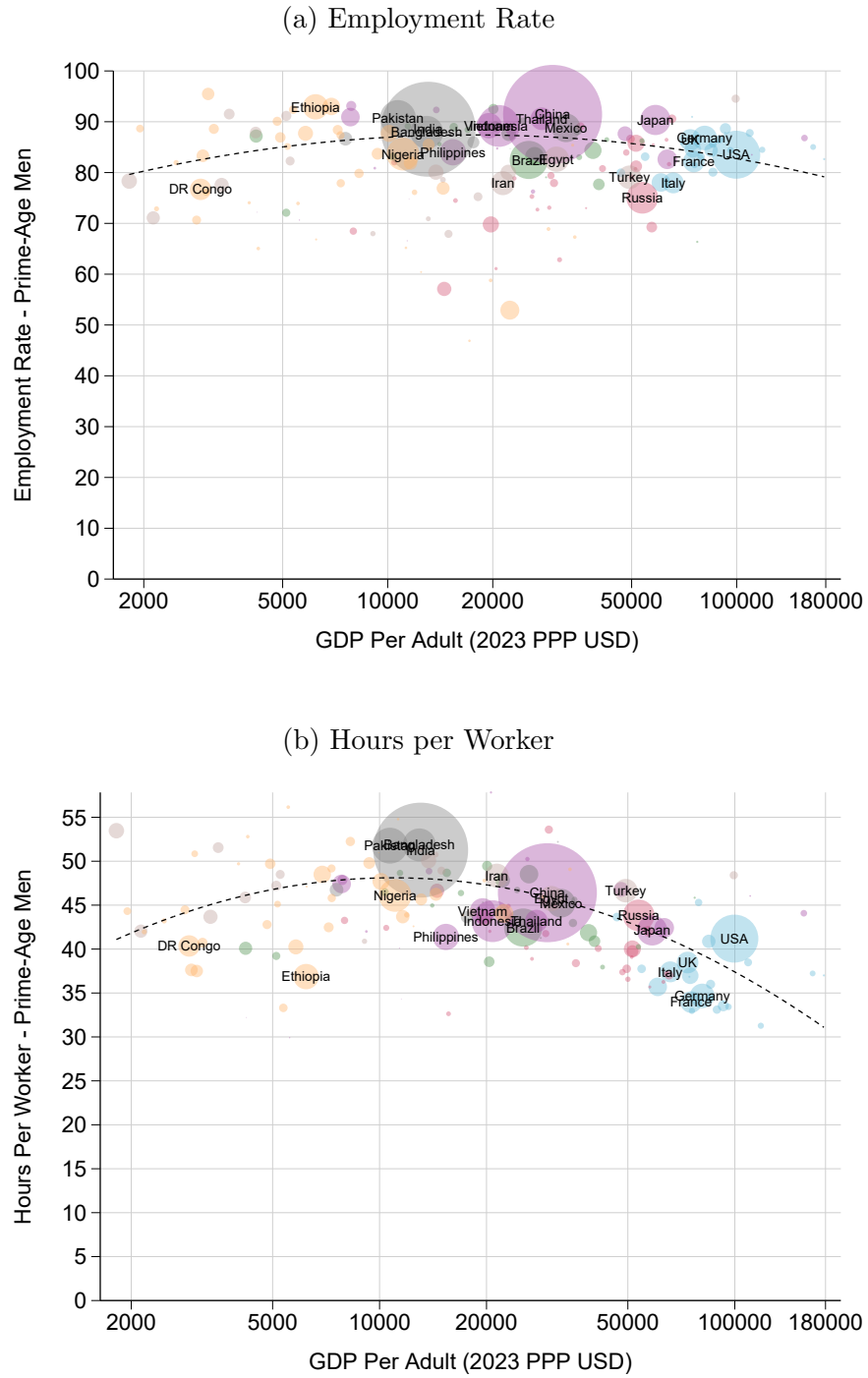
*Notes:* The figure depicts average hours worked among the elderly (aged 60+) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see Figure 5(c) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country’s circle is proportional to its adult population; the largest countries’ names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. The employment rate of elderly workers decreases with development while hours per worker slightly decrease with development.

Figure A9: Hours Worked by the Elderly: Controlling for the Age Structure



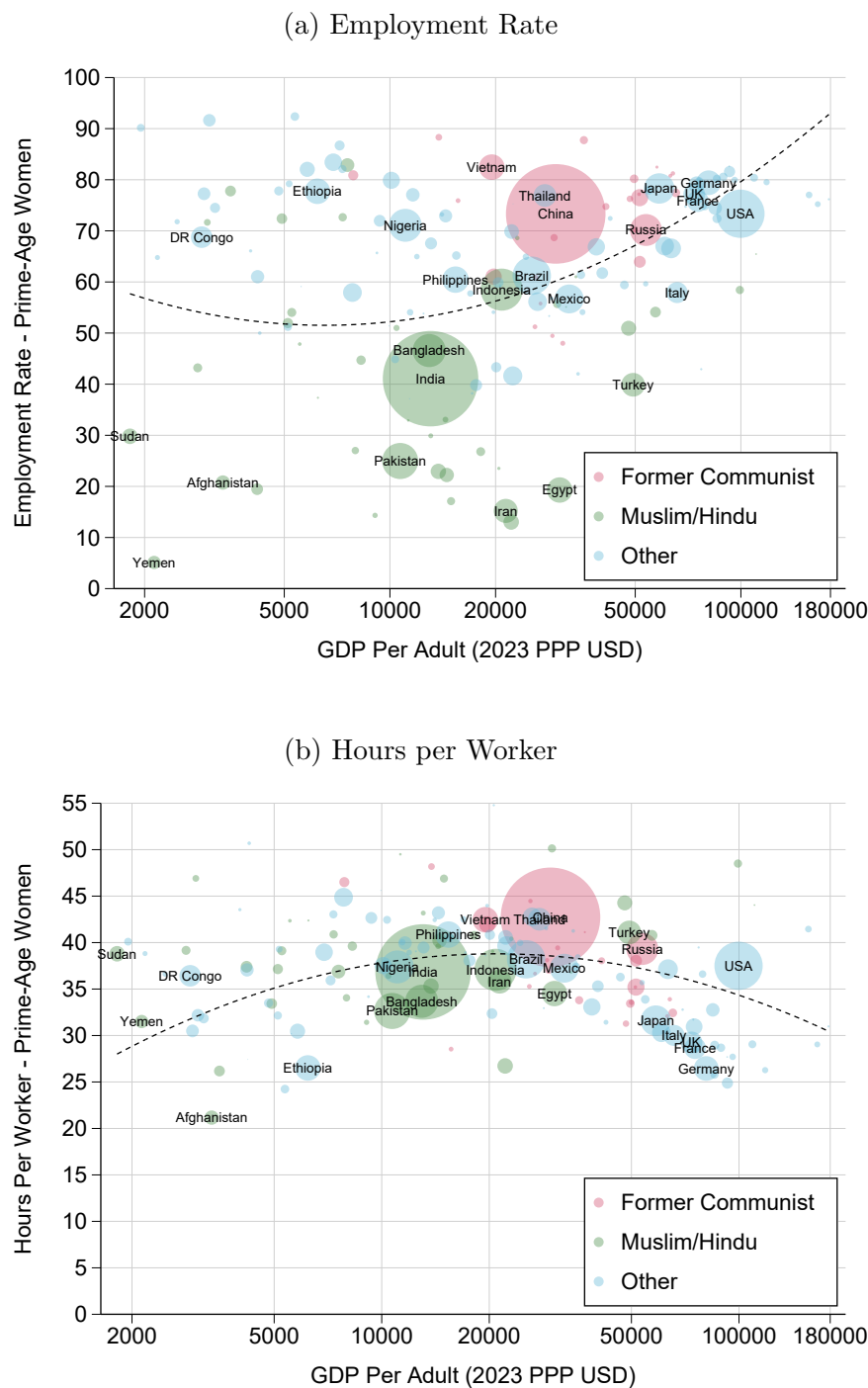
*Notes:* The figure compares actual hours of work of the elderly (aged 60+) to hours of work of the elderly after reweighting each age group to match the U.S. age composition. The sample is restricted to countries with detailed information on the distribution of age within the group of adults aged 60+. Overall, adjusting for the age composition of the elderly has only a modest impact on elderly hours of work and does not change the overall pattern.

Figure A10: Hours of Work of Prime-Age Men: Extensive vs. Intensive Margins



*Notes:* The figure depicts average hours worked among prime-age men (aged 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(a) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A1. The best quadratic fit of the weighted circles is represented by the dashed curve. The employment rate of prime-age men is stable with development while hours per worker are bell-shaped with development.

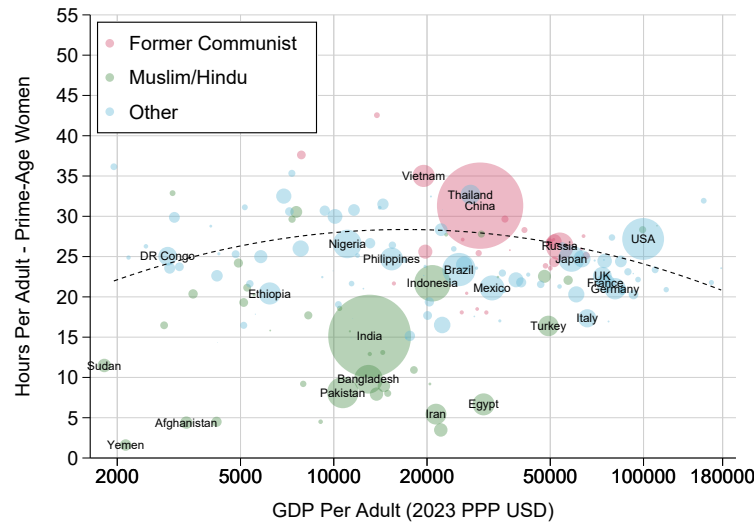
Figure A11: Hours of Work of Prime-Age Women: Extensive vs. Intensive Margins



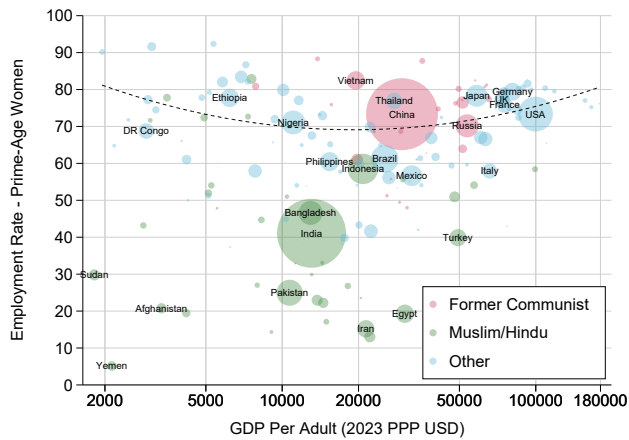
*Notes:* The figure depicts average hours worked among prime-age women (aged 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. The best quadratic fit of the weighted circles is represented by the dashed curve. The employment rate of prime-age women increases with development while hours per worker are bell-shaped with development.

Figure A12: Hours of Work of Prime-Age Women (Fit Excluding Muslim/Hindu Countries)

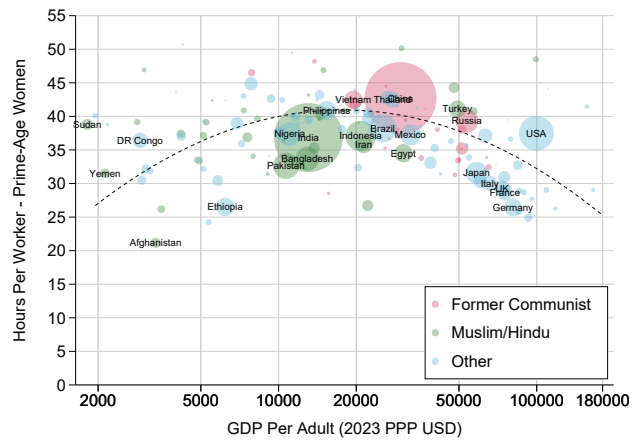
(a) Hours per Adult



(b) Employment Rate



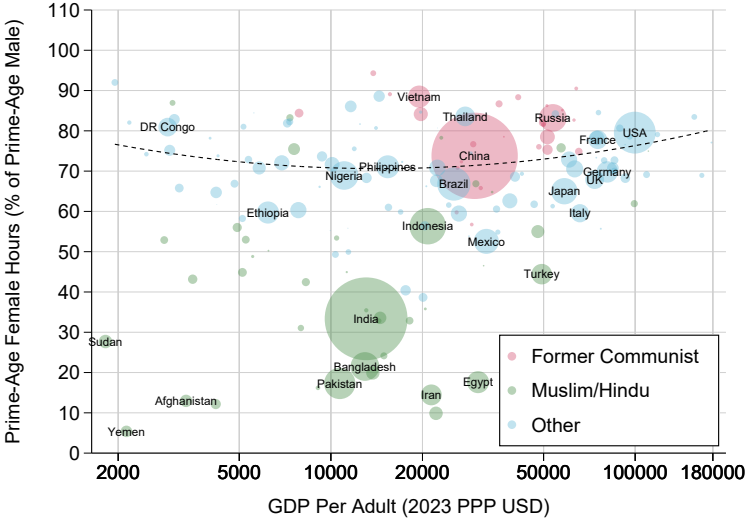
(c) Hours per Worker



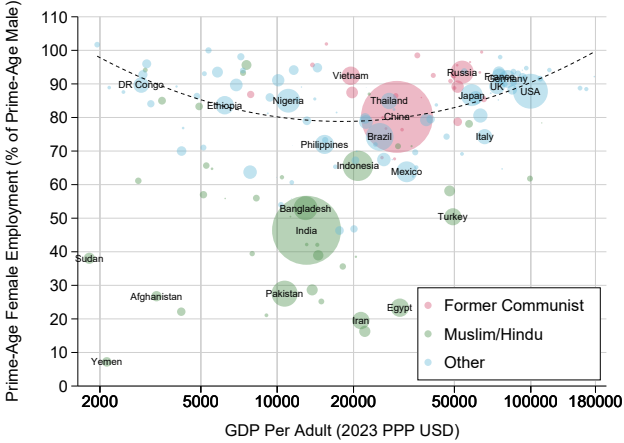
*Notes:* The figure depicts average hours worked among prime-age women (aged 20-59) against GDP per adult in 2023 PPP USD. Panel (a) plots unconditional hours. Panel (b) plots employment rates and panel (c) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country's circle is proportional to its adult population; the largest countries' names are depicted. Colors group countries into three groups most relevant for female hours worked: former communist countries in red, Muslim/Hindu countries in green, and other countries in blue. The best quadratic fit of the weighted circles is represented by the dashed curve. The quadratic fit excludes Muslim/Hindu countries (depicted in green circles) in this specification (see Figure 7(b), and Appendix Figure A11(a)-(b) for the best quadratic fit including all countries). Excluding Muslim/Hindu countries, hours of work of prime-age women are slightly bell-shaped with development; the employment rate of prime-age women is slightly U-shaped with development while hours per worker are strongly bell-shaped with development.

Figure A13: The Gender Gap in Hours Worked (Fit Excluding Muslim/Hindu Countries)

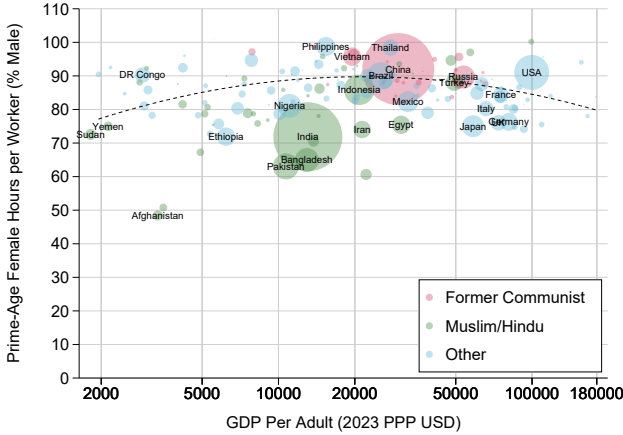
(a) Hours per Adult



(b) Employment Rate

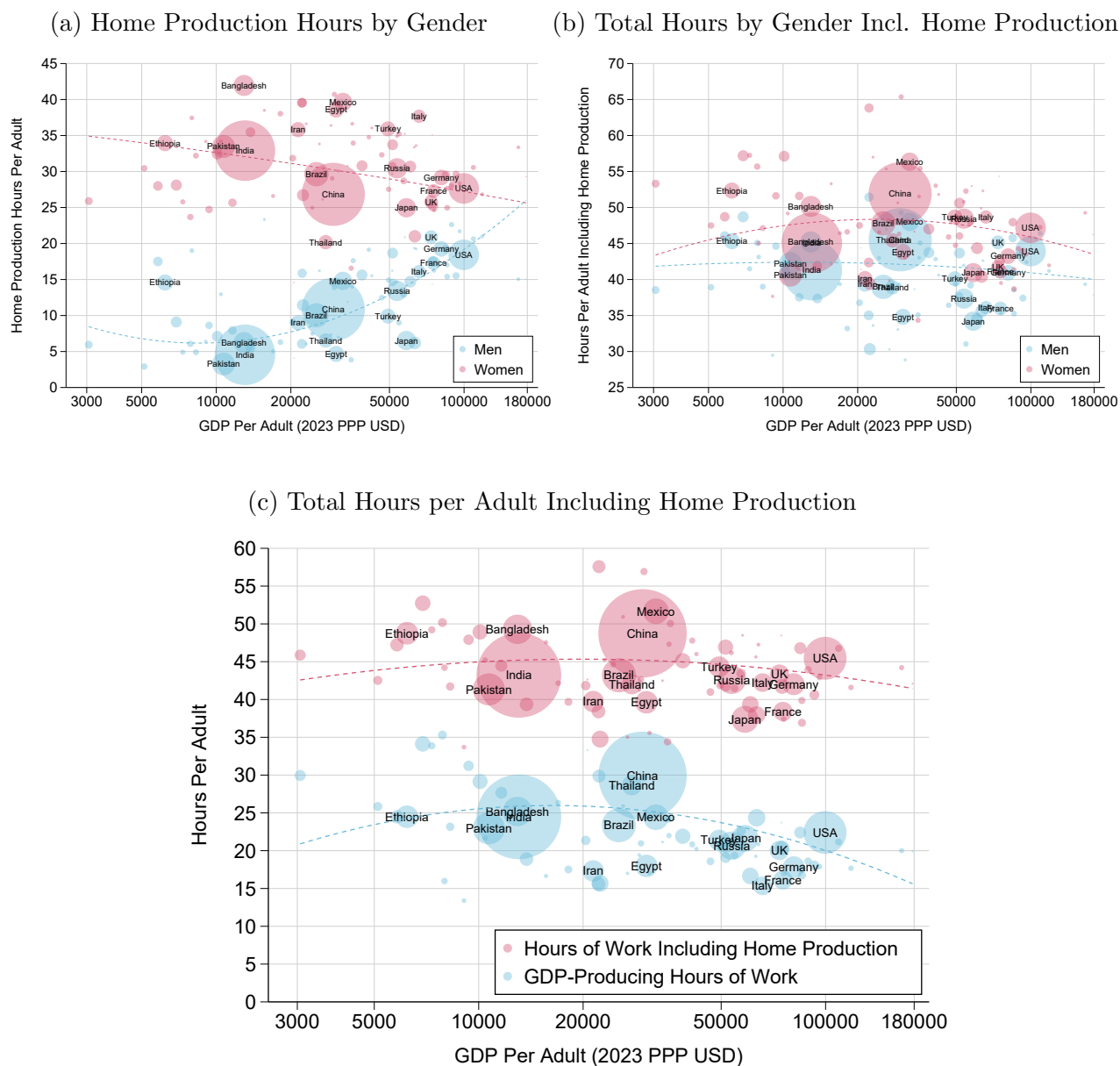


(c) Hours per Worker



Notes: The figure depicts the ratio of average hours worked among prime-age women (aged 20-59) to average hours worked among prime-age men (aged 20-59) against GDP per adult in 2023 PPP USD. Panel (a) plots the gender ratio of unconditional hours. Panel (b) plots the gender ratio of employment rates and panel (c) plots the gender ratio of hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). The area of each country’s circle is proportional to its adult population; the largest countries’ names are depicted. Colors group countries into three groups most relevant for female hours worked: former communist countries in red, Muslim/Hindu countries in green, and other countries in blue. The best quadratic fit of the weighted circles is represented by the dashed curve. The quadratic fit excludes Muslim/Hindu countries (depicted in green circles).

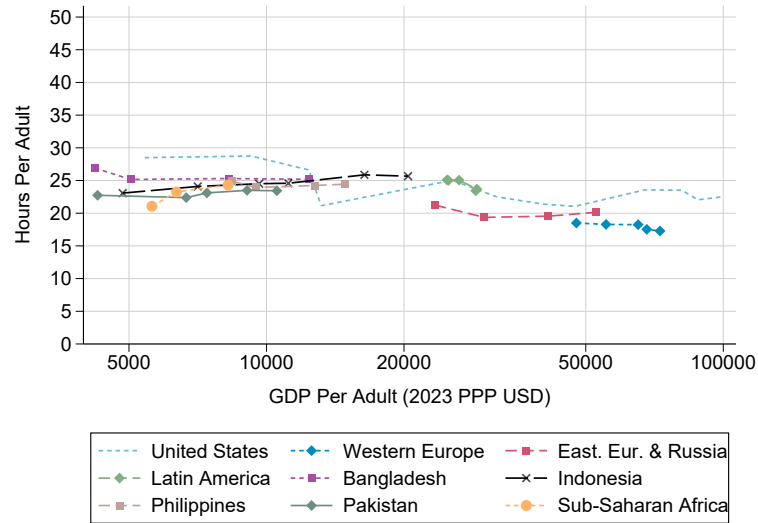
Figure A14: Hours Worked by Gender: Accounting for Domestic Work



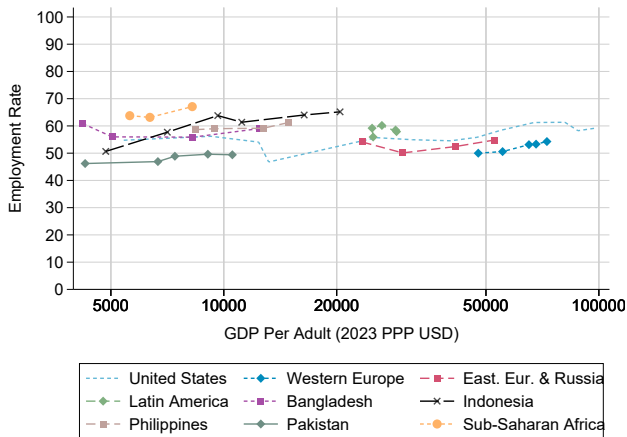
*Notes:* The figure depicts home production hours and total hours of work including home production against GDP per adult in 2023 PPP USD. Panel (a) plots home production hours by gender, based on estimates from time use surveys compiled by Charmes (2022). Panel (b) adds these estimates of home production hours to our estimates of market hours of work to depict total hours including home production by gender. Panel (c) combines estimates from both genders to compare total GDP-producing hours of work with all hours of work including home production over the course of development. Home production hours of work strongly decline with development for women while they increase for men (panel (a)). Total hours including home production are higher for women and relatively stable with development for both genders (panel (b)). As a result, total hours of work per adult including home production are also relatively stable with development (panel (c)).

Figure A15: Evolution of Hours Worked, All Adults: Extensive vs. Intensive Margins

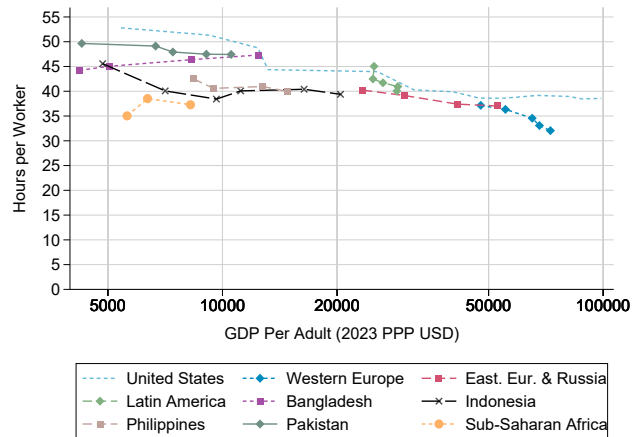
(a) Hours per Adult



(b) Employment Rate

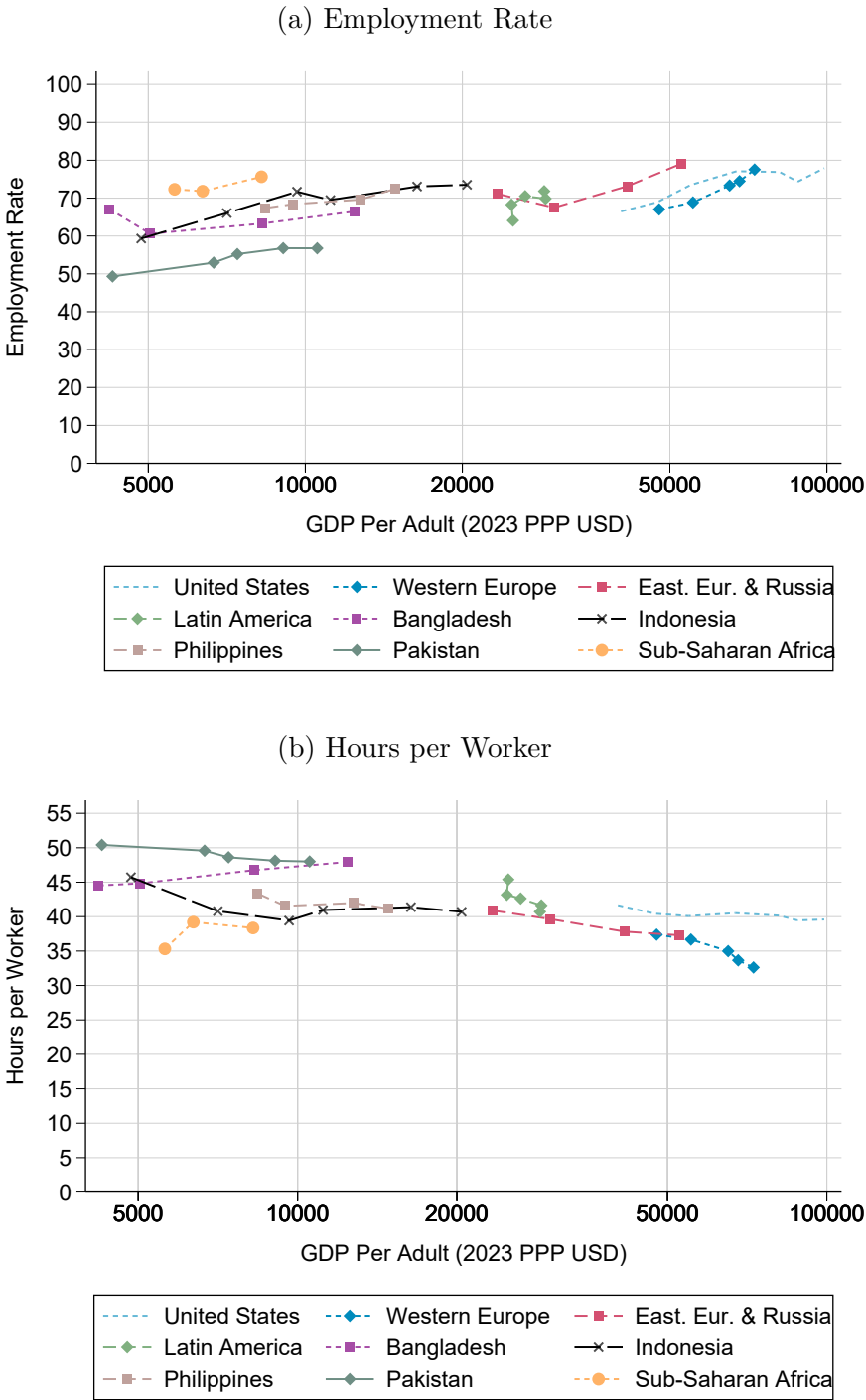


(c) Hours per Worker



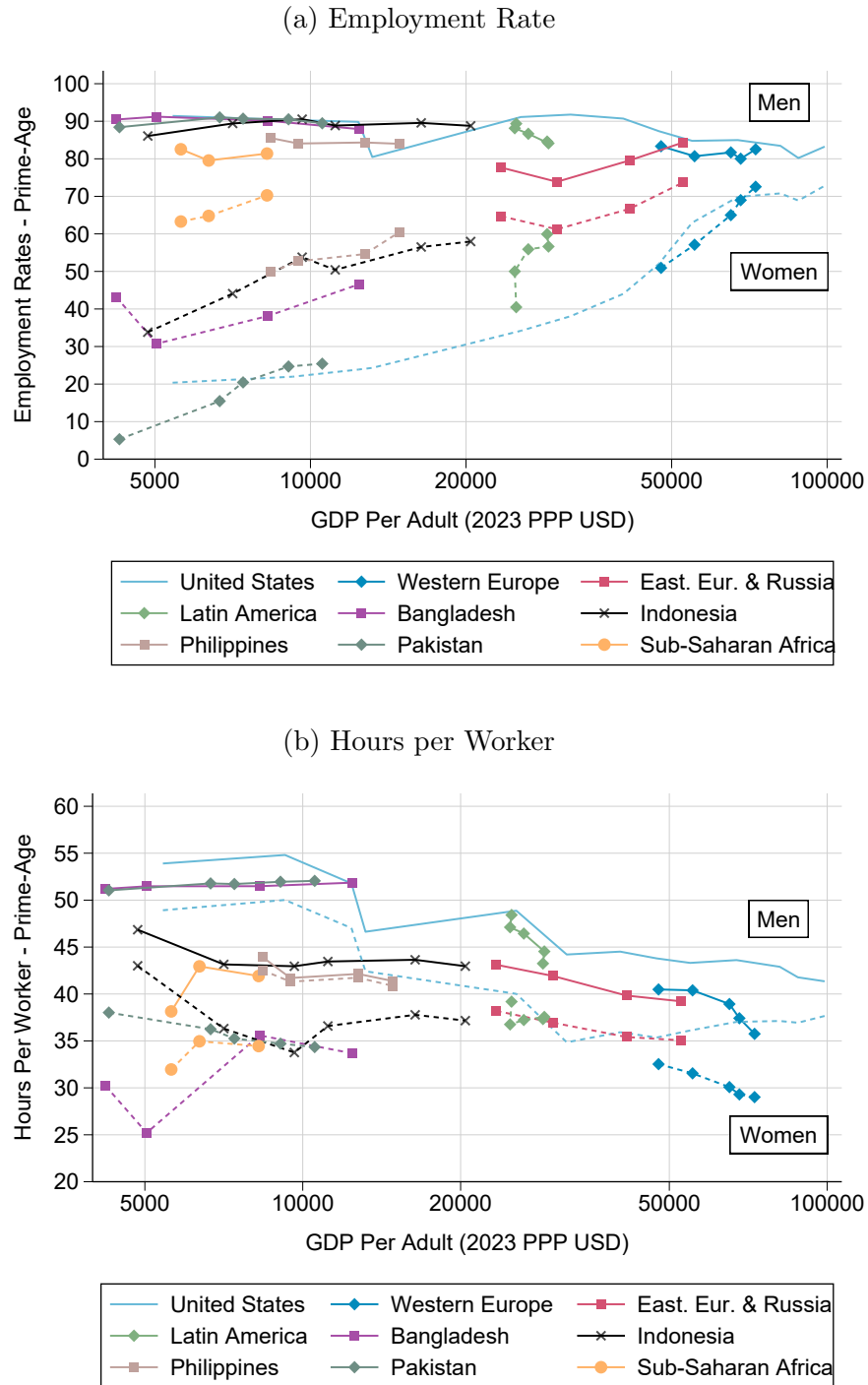
*Notes:* The figure depicts the evolution by decade of (a) hours per adult, (b) employment rates, and (c) hours per worker among all adults for some regions and countries for which we have long time series (covering two decades or more). The estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series, the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. Within regions/countries, hours of work per adult are generally stable over time. Employment rates for all adults tend to increase over time while hours per worker tend to decrease over time.

Figure A16: Evolution of Hours Worked, Prime-Age Adults: Extensive vs. Intensive Margins



Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age adults (see main text Figure 9(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. Employment rates for prime-age adults are increasing over time. Hours per worker tend to be stable for lower income countries/regions and decreasing in richer countries/regions.

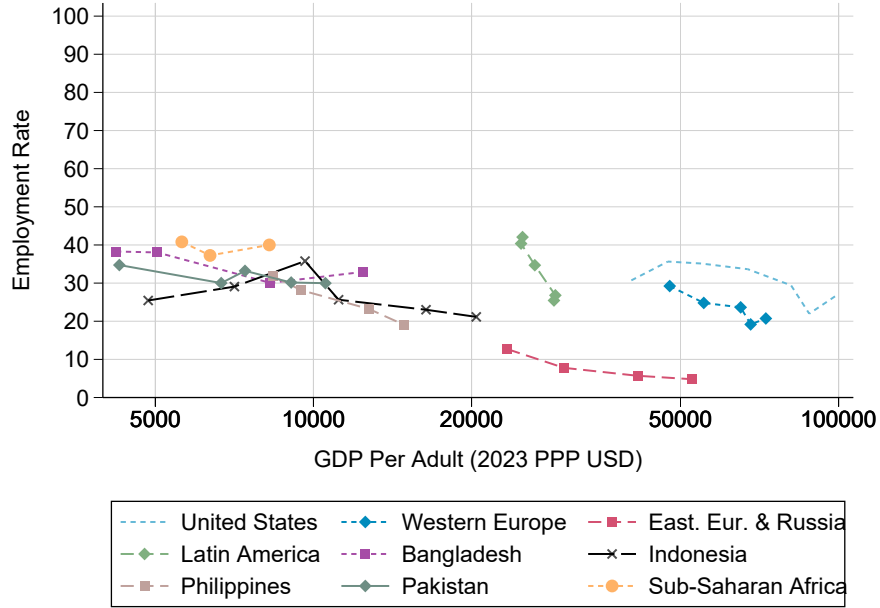
Figure A17: Evolution of Hours Worked by Gender: Extensive vs. Intensive Margins



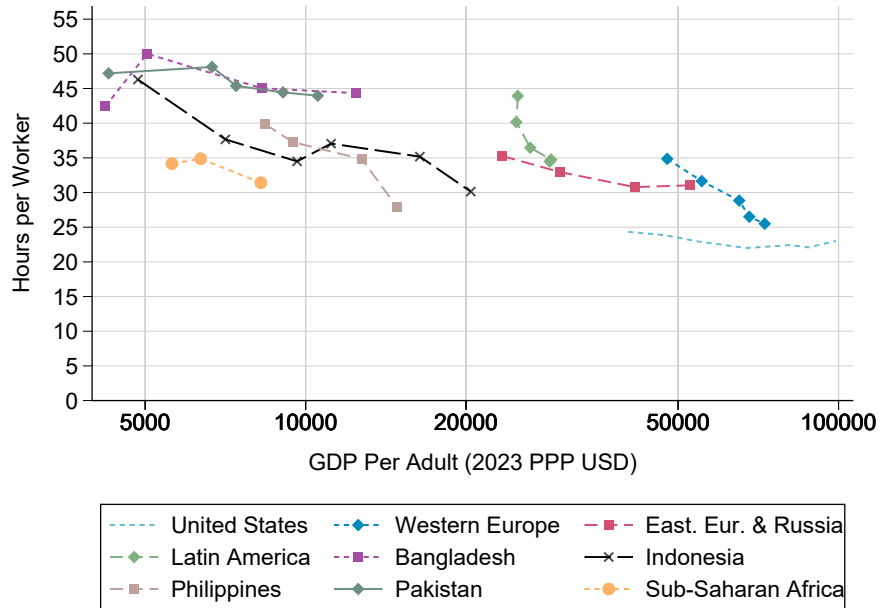
*Notes:* The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age men and women (see main text Figure 9(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series, the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. Employment rates for prime-age men are relatively stable over time. Hours per worker for prime-age men tend to be stable in lower income countries/regions and decreasing in richer countries/regions. Employment rates for prime-age women are increasing over time everywhere, and often sharply so. Hours per worker for prime-age women tend to be stable in lower income countries/regions and slightly decreasing in richer countries/regions.

Figure A18: Evolution of Hours Worked, Young Adults: Extensive vs. Intensive Margins

(a) Employment Rate



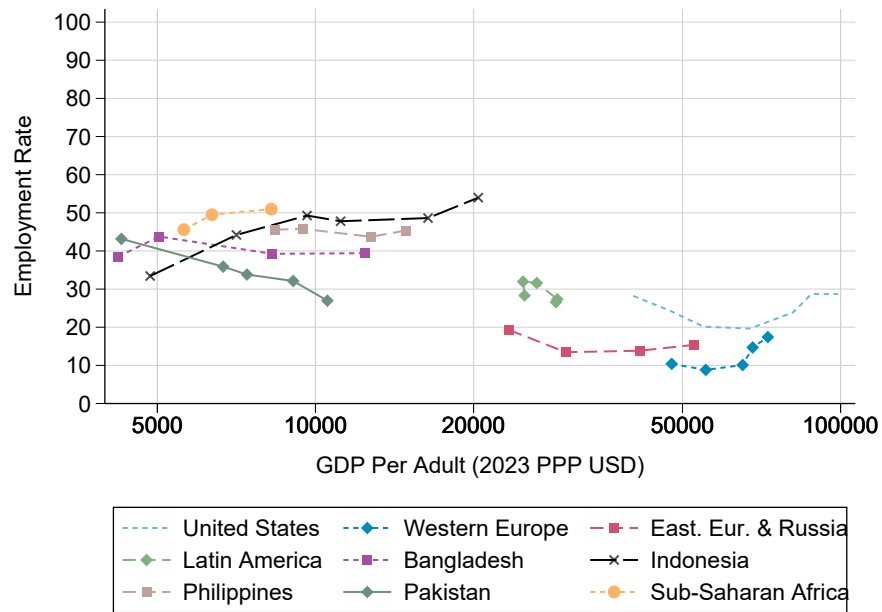
(b) Hours per Worker



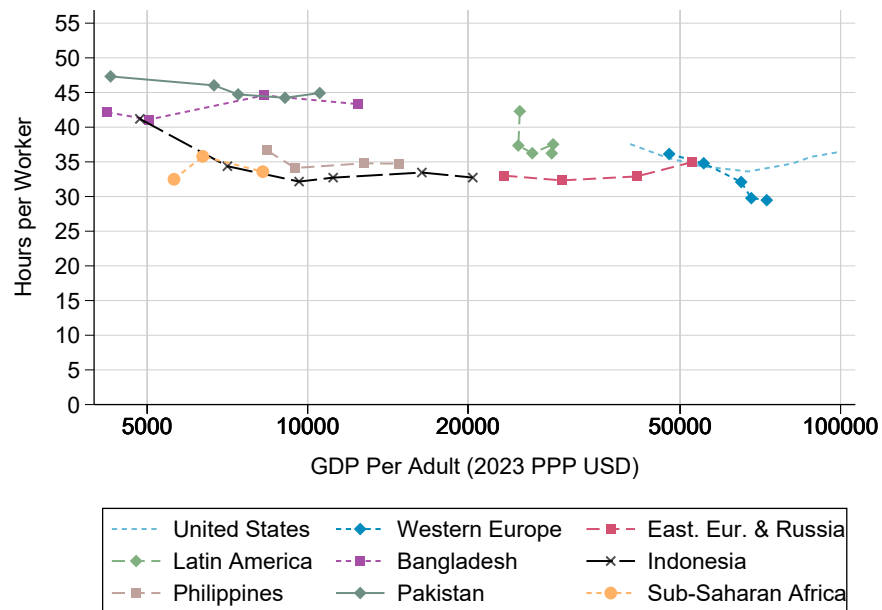
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among young adults aged 15-19 (see main text Figure 10(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series, the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. Employment rates for young adults are decreasing over time everywhere, and often sharply so. Hours per worker for young adults are generally stable within countries/regions, and sometimes decreasing.

Figure A19: Evolution of Hours Worked, Elderly: Extensive vs. Intensive Margins

(a) Employment Rate

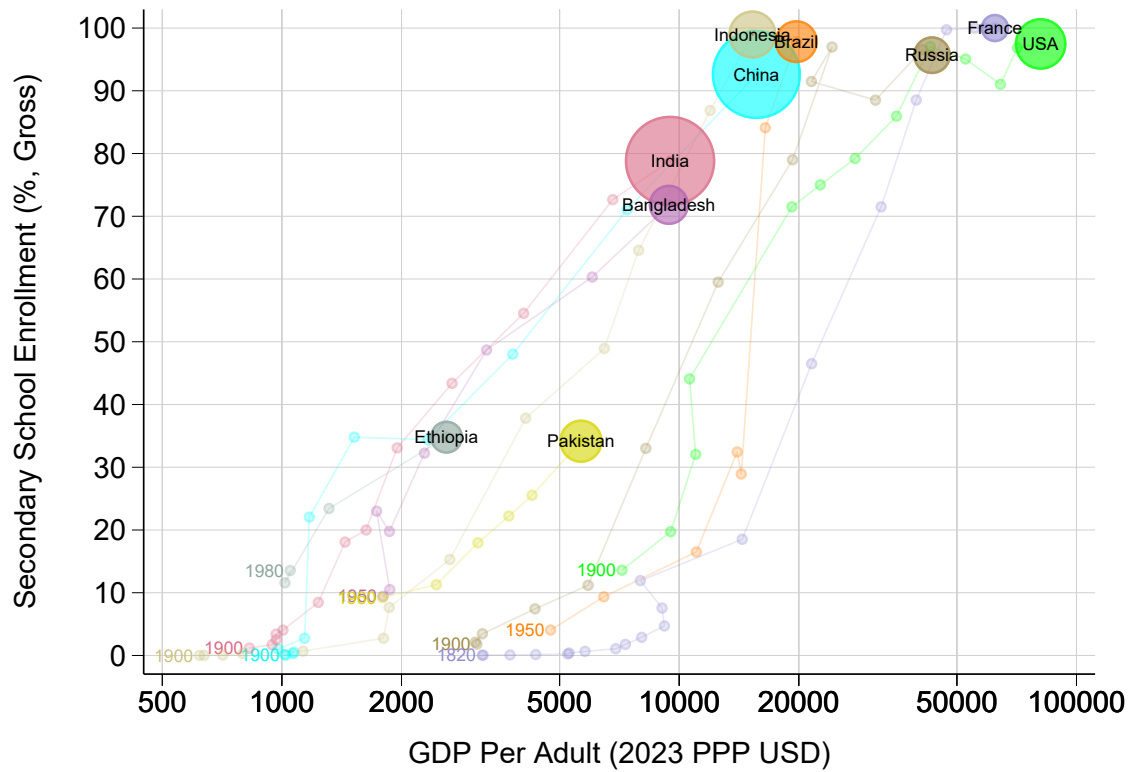


(b) Hours per Worker



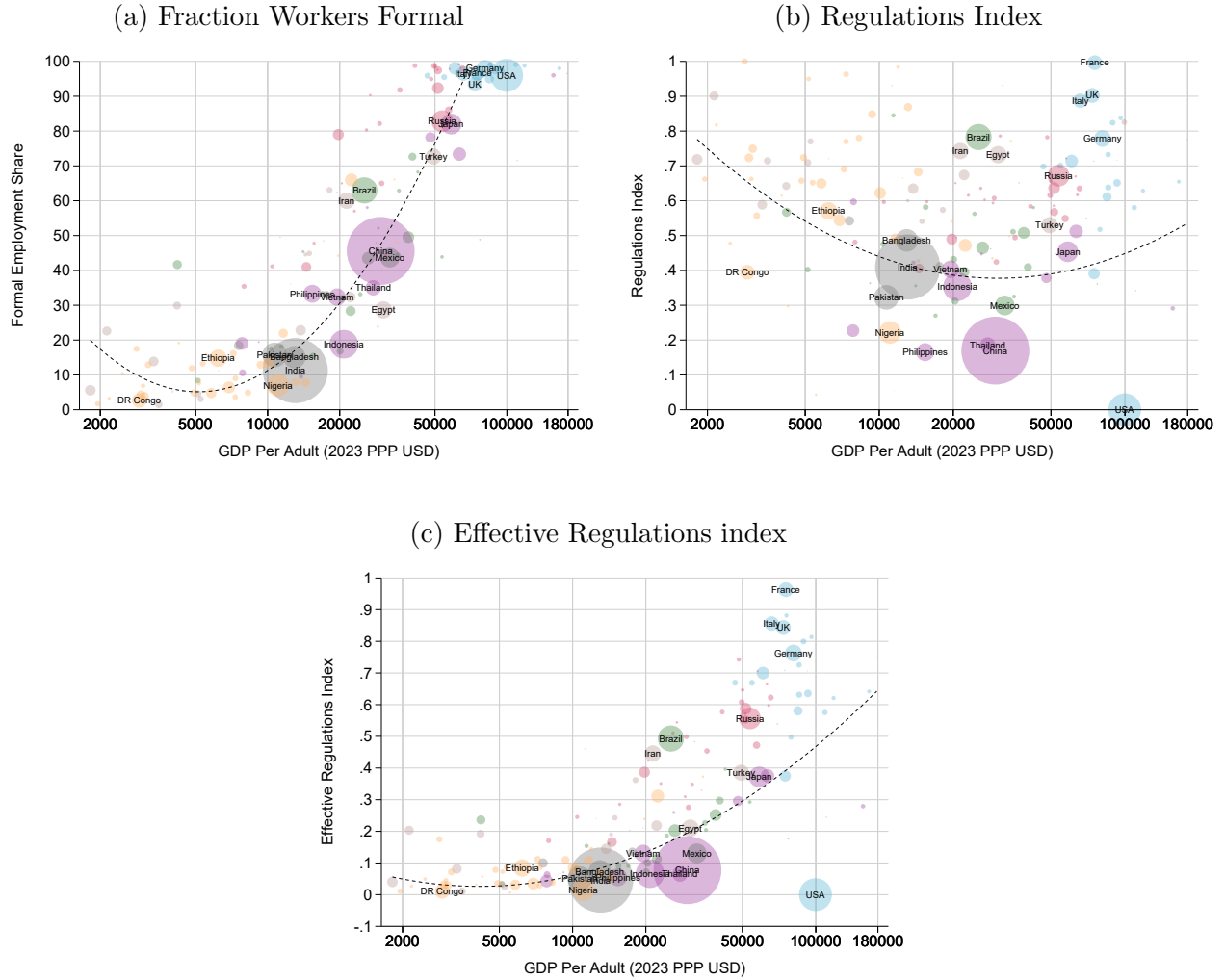
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among the elderly aged 60+ (see main text Figure 10(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series, the last dot is the 2020s (excluding COVID years 2020-21), the next-to-last dot is the 2010s, etc. Employment rates of elderly adults are generally stable or slightly increasing over time within countries/regions. Hours per worker for older adults are generally stable within countries/regions, and sometimes decreasing.

Figure A20: Secondary School Attendance and Development in the Long Run



*Notes:* The figure depicts the evolution of gross secondary school enrollment by decade in selected countries from 1820 to 2010, based on data from Lee and Lee (2016). Estimates are plotted against country GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series, the last dot is 2010, the next-to-last dot is 2000, etc. Secondary school attendance sharply increases with development and has expanded in developing countries at a much earlier stage of development than it did in frontier economies.

Figure A21: Formal Employment and Regulations vs. GDP per Adult



*Notes:* Panel (a) depicts the fraction of formal workers (among all workers) against GDP per adult in 2023 PPP USD. Panel (b) depicts the working hours regulations index by country created using the working hours regulations variables compiled in the World Bank [Employing Workers](#) database. Panel (c) depicts the effective working hours regulations index obtained by interacting the two variables. Panel (a) shows that formality is extremely low in poor countries and rises sharply with economic development. Panel (b) shows that working hours regulations, which generally apply only to formal workers, are U-shaped with development but with substantial heterogeneity across countries. Panel (c) shows that the effective regulations index sharply increases with economic development.

Figure A22: Social Spending, Formality, and Regulations vs. Hours per Prime-Age Adult



*Notes:* Panel (a) depicts government social spending (defined as government spending on cash and quasi-cash transfers to individuals but excluding public pensions) relative to GDP against average hours of work per prime-age adult by country. Panel (b) depicts the fraction of formal workers (among all workers) against average hours of work per prime-age adult by country. Panel (c) depicts the working hours regulations index vs. hours of work by country. Panel (d) depicts the effective working hours regulations index vs. hours of work by country. The working hours regulations index by country is created using the working hours regulations variables compiled in the World Bank [Employing Workers](#) database. The effective regulations index is the product of formal employment and the regulations index. Panel (a) shows that prime-age hours of work are lower when social spending is higher. Panel (b) shows that prime-age hours of work are bell-shaped with formality. Panel (c) shows that hours per adult are lower when employment regulations are strong. Panel (d) shows that hours per adult also decline with the effective regulations index.

Table A1: A New Database on Global Hours Worked

	Number of Countries	Earliest Year	Number of Surveys	Sample Size	Population Covered (Last Year)
Western Europe and Anglosphere	24	1963	849	166,945,598	99.4%
Eastern Europe and ex-USSR	28	1991	503	38,104,614	100%
Latin America	24	1971	515	92,713,370	97.2%
East and Southeast Asia	20	1976	246	113,789,711	96.8%
South Asia	6	1973	64	11,507,960	100%
Middle East and North Africa	18	1991	163	36,189,891	85.3%
Sub-Saharan Africa	40	1987	157	10,395,221	98.5%
World	160	1963	2,497	469,646,365	97.3%

*Notes.* This table describes various features of the new database we have constructed by region (regions are defined in Figure A1) and globally in the last row. Sample size sums over all individual micro-records. The last column reports the fraction of the population covered (when pooling across countries).

Table A2: Survey Data Sources

Source	Sample Size	Number of Countries	Number of Surveys	Time Period
I2D2	13,837,500	55	191	1977-2017
GMD	944,662	4	4	2011-2022
GLD	116,780,229	20	246	1981-2022
ILO	198,609,864	98	968	1976-2023
EU-LFS	114,141,576	29	908	1983-2022
Other	25,404,275	29	182	1960-2023

*Notes.* This table reports the number of individual respondents, the number of countries, the number of surveys, and the time period covered for each data source in our final database. I2D2: World Bank I2D2 survey microdatabase. GMD: World Bank Global Monitoring Database. GLD: World Bank Global Labor Database. ILO: International Labour Organization labor force survey microdatabase. EU-LFS: European Union Labour Force Surveys. Other: Luxembourg Income Study survey microdata tabulations, IPUMS International census microdata, Life in Transition Survey, and other country-specific microdata sources.

Table A3: Elasticities of Hours Worked with Respect to GDP per Adult, with Squared Term

	(1)	(2)	(3)	(4)	Prime-Age Men			Prime-Age Women		
					(5)	(6)	(7)	(8)	(9)	(10)
	All Adults	Young 15-19	Elderly 60+	Prime-Age 20-59	Hours per Adult	Hours per Worker	Employment Rate	Hours per Adult	Hours per Worker	Employment Rate
Log GDP Per Adult	1.17** (0.52)	-1.94 (1.21)	0.54 (0.95)	0.92** (0.45)	1.32*** (0.35)	0.95*** (0.27)	0.34** (0.16)	0.31 (1.27)	1.05*** (0.39)	-0.72 (1.09)
Log GDP Per Adult Squared	-0.06** (0.03)	0.08 (0.06)	-0.04 (0.05)	-0.05** (0.02)	-0.07*** (0.02)	-0.05*** (0.01)	-0.02** (0.01)	-0.01 (0.06)	-0.05*** (0.02)	0.05 (0.05)
Mean Hours	24.7	6.6	12.5	30.7	39.3	45.6	86.3	22.3	37.5	59.6
N	160	159	160	160	160	160	160	160	160	160
Adjusted $R^2$	0.13	0.24	0.30	0.08	0.34	0.42	0.04	0.11	0.15	0.14

*Notes.* This table reproduces Table 2, panel A but includes both log GDP per adult and its square. Hours worked are bell-shaped with development, especially for hours per worker and for prime-age men. Appendix Table B2 reproduces this table without weighting by population size.

Table A4: Elasticities of Hours per Worker: Sensitivity to Alternative Samples and Empirical Specifications

	Population-Weighted				Unweighted			
	Coefficient	SE	$R^2$	$N$	Coefficient	SE	$R^2$	$N$
<b>A. Cross Section</b>								
<b>Bick et al. 2018 Core Sample</b>	-0.076**	(0.033)	0.251	49	-0.07**	(0.030)	0.185	49
Bick et al. 2018 Full Sample	-0.069***	(0.024)	0.229	79	-0.08***	(0.021)	0.256	79
<b>Full Sample</b>	<b>-0.044**</b>	<b>(0.020)</b>	<b>0.102</b>	<b>160</b>	<b>-0.038***</b>	<b>(0.011)</b>	<b>0.076</b>	<b>160</b>
Excluding China and India	-0.036**	(0.016)	0.088	158	-0.038***	(0.011)	0.076	158
Excluding Small and Oil Countries	-0.049**	(0.021)	0.123	124	-0.049***	(0.012)	0.140	124
Controlling for Muslim/Hindu Share	-0.017	(0.017)	0.233	160	-0.022**	(0.011)	0.218	160
Controlling for Muslim/Hindu and Excl. Small/Oil	-0.022	(0.019)	0.235	124	-0.033**	(0.013)	0.214	124
Controlling for Region Fixed Effects	0.014	(0.018)	0.587	160	0.027**	(0.013)	0.353	160
Using Fixed Weights by Age-Gender	-0.04**	(0.017)	0.097	160	-0.048***	(0.012)	0.113	160
<b>B. Panel Data</b>								
Full Sample without Country Fixed Effects	-0.082***	(0.005)	0.301	2162	-0.108***	(0.003)	0.343	2162
<b>Full Sample</b>	<b>-0.083***</b>	<b>(0.008)</b>	<b>0.141</b>	<b>2162</b>	<b>-0.154***</b>	<b>(0.005)</b>	<b>0.302</b>	<b>2162</b>
Low/Lower-Middle-Income Countries	-0.006	(0.015)	0.002	306	-0.027**	(0.011)	0.020	306
Upper-Middle/High-Income Countries	-0.115***	(0.011)	0.211	1856	-0.179***	(0.006)	0.369	1856
Muslim/Hindu Countries	-0.014	(0.016)	0.014	267	-0.035***	(0.012)	0.035	267
Western European Countries	-0.369***	(0.020)	0.684	576	-0.241***	(0.009)	0.568	576
Other Countries	-0.088***	(0.012)	0.132	1329	-0.145***	(0.007)	0.256	1329

*Notes.* This table reproduces Table 6 but for hours per worker. It reports estimates of the elasticity of hours per worker with respect to GDP per adult for alternative samples and specifications.

Table A5: Elasticities of Employment Rates: Sensitivity to Alternative Samples and Empirical Specifications

	Population-Weighted				Unweighted			
	Coefficient	SE	$R^2$	$N$	Coefficient	SE	$R^2$	$N$
<b>A. Cross Section</b>								
<b>Bick et al. 2018 Core Sample</b>	-0.035	(0.045)	0.034	49	-0.076***	(0.024)	0.164	49
Bick et al. 2018 Full Sample	-0.038	(0.032)	0.039	79	-0.04*	(0.022)	0.042	79
<b>Full Sample</b>	<b>0.002</b>	<b>(0.025)</b>	<b>0.000</b>	<b>160</b>	<b>-0.012</b>	<b>(0.015)</b>	<b>0.004</b>	<b>160</b>
Excluding China and India	-0.027	(0.020)	0.021	158	-0.013	(0.015)	0.005	158
Excluding Small and Oil Countries	0.006	(0.027)	0.001	124	-0.024	(0.017)	0.018	124
Controlling for Muslim/Hindu Share	-0.064***	(0.019)	0.344	160	-0.037**	(0.015)	0.189	160
Controlling for Muslim/Hindu and Excl. Small/Oil	-0.058***	(0.019)	0.335	124	-0.066***	(0.015)	0.289	124
Controlling for Region Fixed Effects	-0.022	(0.034)	0.596	160	-0.022	(0.027)	0.230	160
Using Fixed Weights by Age-Gender	0.031	(0.023)	0.024	160	0.008	(0.015)	0.002	160
<b>B. Panel Data</b>								
Full Sample without Country Fixed Effects	-0.016***	(0.006)	0.008	2162	0.032***	(0.005)	0.018	2162
<b>Full Sample</b>	<b>0.07***</b>	<b>(0.008)</b>	<b>0.111</b>	<b>2162</b>	<b>0.115***</b>	<b>(0.006)</b>	<b>0.165</b>	<b>2162</b>
Low/Lower-Middle-Income Countries	0.047**	(0.019)	0.106	306	0.034**	(0.013)	0.023	306
Upper-Middle/High-Income Countries	0.08***	(0.009)	0.118	1856	0.131***	(0.006)	0.200	1856
Muslim/Hindu Countries	0.077***	(0.018)	0.266	267	0.125***	(0.016)	0.201	267
Western European Countries	0.115***	(0.020)	0.210	576	0.171***	(0.008)	0.425	576
Other Countries	0.027**	(0.011)	0.011	1329	0.086***	(0.008)	0.081	1329

*Notes.* This table reproduces Table 6 but for employment rates. It reports estimates of the elasticity of employment rates with respect to GDP per adult for alternative samples and specifications.

Table A6: Elasticities of Prime-Age Hours Worked: Sensitivity to Alternative Samples and Empirical Specifications

	Population-Weighted				Unweighted			
	Coefficient	SE	$R^2$	$N$	Coefficient	SE	$R^2$	$N$
<b><u>A. Cross Section</u></b>								
<b>Bick et al. 2018 Core Sample</b>	-0.036	(0.037)	0.046	49	-0.066***	(0.024)	0.154	49
Bick et al. 2018 Full Sample	-0.034	(0.028)	0.041	79	-0.048***	(0.017)	0.081	79
<b>Full Sample</b>	<b>0.02</b>	<b>(0.023)</b>	<b>0.010</b>	<b>160</b>	<b>0.006</b>	<b>(0.014)</b>	<b>0.001</b>	<b>160</b>
Excluding China and India	0.004	(0.016)	0.001	158	0.005	(0.014)	0.001	158
Excluding Small and Oil Countries	0.021	(0.024)	0.014	124	-0.006	(0.015)	0.002	124
Controlling for Muslim/Hindu Share	-0.023	(0.019)	0.173	160	-0.009	(0.015)	0.076	160
Controlling for Muslim/Hindu and Excl. Small/Oil	-0.018	(0.020)	0.153	124	-0.036**	(0.014)	0.177	124
Controlling for Region Fixed Effects	0.039	(0.032)	0.577	160	0.039	(0.026)	0.214	160
Using Fixed Weights by Age-Gender	0.012	(0.023)	0.004	160	-0.01	(0.015)	0.004	160
<b><u>B. Panel Data</u></b>								
Full Sample without Country Fixed Effects	-0.019***	(0.005)	0.013	2162	-0.01**	(0.005)	0.002	2162
<b>Full Sample</b>	<b>0.042***</b>	<b>(0.010)</b>	<b>0.032</b>	<b>2162</b>	<b>0.026***</b>	<b>(0.006)</b>	<b>0.008</b>	<b>2162</b>
Low/Lower-Middle-Income Countries	0.064***	(0.013)	0.158	306	0.046***	(0.014)	0.036	306
Upper-Middle/High-Income Countries	0.033**	(0.013)	0.016	1856	0.022***	(0.007)	0.006	1856
Muslim/Hindu Countries	0.084***	(0.012)	0.340	267	0.119***	(0.017)	0.167	267
Western European Countries	-0.135***	(0.027)	0.185	576	-0.026**	(0.011)	0.011	576
Other Countries	0.004	(0.015)	0.000	1329	0.025***	(0.009)	0.007	1329

*Notes.* This table reproduces Table 6 but for prime-age adults aged 20-59 (instead of all adults aged 15+). It reports estimates of the elasticity of prime-age hours worked with respect to GDP per adult for alternative samples and specifications.

Table A7: Elasticities of Hours per Adult: Panel Estimates Excluding Muslim/Hindu, Small, and Oil Countries

	Population-Weighted				Unweighted			
	Coefficient	SE	$R^2$	$N$	Coefficient	SE	$R^2$	$N$
<b>A. Hours per Adult</b>								
<b>Full Sample</b>	<b>-0.091***</b>	<b>(0.018)</b>	<b>0.063</b>	<b>1709</b>	<b>-0.027***</b>	<b>(0.008)</b>	<b>0.007</b>	<b>1709</b>
Low/Lower-Middle-Income Countries	-0.051	(0.038)	0.037	187	-0.005	(0.020)	0.000	187
Upper-Middle/High-Income Countries	-0.098***	(0.020)	0.067	1522	-0.03***	(0.009)	0.008	1522
Western European Countries	-0.137***	(0.027)	0.145	497	-0.019	(0.013)	0.005	497
Other Countries	-0.082***	(0.020)	0.051	1212	-0.031***	(0.010)	0.008	1212
<b>B. Hours per Worker</b>								
<b>Full Sample</b>	<b>-0.152***</b>	<b>(0.013)</b>	<b>0.273</b>	<b>1709</b>	<b>-0.175***</b>	<b>(0.006)</b>	<b>0.372</b>	<b>1709</b>
Low/Lower-Middle-Income Countries	-0.044*	(0.026)	0.059	187	-0.041***	(0.015)	0.040	187
Upper-Middle/High-Income Countries	-0.169***	(0.015)	0.309	1522	-0.194***	(0.006)	0.428	1522
Western European Countries	-0.329***	(0.023)	0.588	497	-0.221***	(0.009)	0.535	497
Other Countries	-0.117***	(0.012)	0.210	1212	-0.154***	(0.007)	0.304	1212
<b>C. Employment Rates</b>								
<b>Full Sample</b>	<b>0.053***</b>	<b>(0.011)</b>	<b>0.039</b>	<b>1709</b>	<b>0.124***</b>	<b>(0.007)</b>	<b>0.180</b>	<b>1709</b>
Low/Lower-Middle-Income Countries	-0.025	(0.023)	0.024	187	0.013	(0.015)	0.004	187
Upper-Middle/High-Income Countries	0.065***	(0.012)	0.054	1522	0.14***	(0.007)	0.214	1522
Western European Countries	0.191***	(0.015)	0.463	497	0.202***	(0.009)	0.527	497
Other Countries	0.025**	(0.012)	0.009	1212	0.09***	(0.008)	0.090	1212

*Notes.* This table reproduces Table 6, Panel B but after removing all Muslim/Hindu-majority countries as well as small and oil countries from the sample. It reports panel estimates of the elasticity of hours per adult with respect to GDP per adult for alternative samples and specifications. The sample covers 74 countries in all panels. All estimates include country fixed effects.

Table A8: Prime-Age Log Hours: A Great Gender Reshuffling within the Household

	Prime-Age Women				Prime-Age Men			
	(1) All Women	(2) Living With Prime-Age Men	(3) Living Without Prime-Age Men	(4) Living Alone	(5) All Men	(6) Living With Prime-Age Women	(7) Living Without Prime-Age Women	(8) Living Alone
<b>Panel A: Cross Section</b>								
Log GDP Per Adult	0.18** (0.07)	0.19*** (0.07)	0.13** (0.06)	0.13* (0.07)	-0.04* (0.02)	-0.02 (0.02)	-0.08*** (0.02)	-0.06** (0.03)
Mean Hours	24.3	23.8	24.8	29.0	38.1	38.0	37.3	39.2
N	130	130	130	130	130	130	130	130
<b>Panel B: Panel Data</b>								
Log GDP Per Adult	0.36*** (0.03)	0.43*** (0.04)	0.18*** (0.02)	0.10*** (0.03)	-0.13*** (0.01)	-0.12*** (0.01)	-0.16*** (0.01)	-0.05** (0.02)
Mean Hours	21.0	20.3	23.2	27.4	36.0	36.7	33.9	34.3
N	1,614	1,611	1,614	1,614	1,614	1,613	1,614	1,613

*Notes.* This table reports regression results linking log hours of work of prime-age men and prime-age women and log GDP per adult (elasticities) across countries in panel A and within countries and over time in panel B following the model of Table 2 and zooming in on household situation for the sample of country-years where we know household composition. Regressions are weighted by adult population size in each country. Panel A includes 68% of the world population from 130 countries. Panel B includes a subset of 80 countries for which we have longer time series spanning more than 20 years. Regressions in Panel B include country fixed effects. Column (1) is for unconditional hours of work of women as in Table 2, column (8); coefficients differ due to differences in countries in the regression. Column (2) is for hours of work of women living with a prime-age man in the household. The coefficient on log GDP is slightly larger for this group. Column (3) is for hours of work of women not living with a prime-age man in the household. The coefficient on log GDP is substantially smaller for this group. Column (4) is for hours of work of women living alone (a subset of the sample in column 3). The coefficient on log GDP is even smaller for this group. This result implies that the rise in hours of work of women is larger among women living with adult men (in most cases married or cohabitating). Columns (5)-(8) repeat the same analysis for men. For men, the fall in hours of work is actually larger for men not living with prime-age women (i.e., men not married or cohabitating with a female partner).

Table A9: Elasticities of Prime-Age Hours Worked (Before Controls)

	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours Men	Prime-Age Hours Women
<b>Panel A. Population-Weighted</b>						
$\log 1 - \tau(L)$	0.586*** (0.094)	0.196** (0.084)	0.496*** (0.066)	-0.289*** (0.110)	0.632*** (0.100)	-0.756** (0.350)
N	138	138	138	138	138	138
Adjusted $R^2$	0.22	0.03	0.43	0.07	0.40	0.05
<b>Panel B. Unweighted</b>						
$\log 1 - \tau(L)$	0.591*** (0.069)	0.207*** (0.062)	0.494*** (0.039)	-0.270*** (0.065)	0.456*** (0.045)	-0.266 (0.173)
N	138	138	138	138	138	138
Adjusted $R^2$	0.25	0.04	0.44	0.06	0.28	0.00

*Notes.* This table reproduces Table 7, Panel A but does not include any control (Table 7, panel A controls for log GDP per adult and the Muslim/Hindu population share). The coefficients thus correspond to unconditional elasticities of hours worked with respect to net-of-tax rates  $1 - \tau_L$ . Higher taxes are negatively related to hours per adult and prime-age hours among all adults and men, but, in contrast to Table 7, panel A, are positively related to female hours. The negative elasticity for women likely reflects the fact that women work more in richer countries which also tend to have higher labor taxes (such an effect is controlled for in Table 7, panel A).

Table A10: Elasticities of Hours Worked with Respect to Net-of-Labor Tax Rates: Panel Data

**A. Without Time Trend**

	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours, Men	Prime-Age Hours, Women
$\log 1 - \tau(L)$	0.71*** (0.07)	0.38*** (0.06)	0.63*** (0.04)	-0.25*** (0.04)	0.91*** (0.05)	-0.50*** (0.11)
Log GDP Per Adult	0.05*** (0.01)	0.07*** (0.01)	-0.03*** (0.01)	0.10*** (0.01)	-0.05*** (0.01)	0.29*** (0.02)
N	1959	1959	1959	1959	1959	1959
Adjusted $R^2$	0.88	0.83	0.88	0.89	0.86	0.89

**B. With Time Trend**

	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours, Men	Prime-Age Hours, Women
$\log 1 - \tau(L)$	0.50*** (0.09)	0.27*** (0.08)	0.42*** (0.05)	-0.16*** (0.05)	0.36*** (0.07)	0.16 (0.13)
Log GDP Per Adult	0.13*** (0.03)	0.11*** (0.02)	0.05*** (0.01)	0.06*** (0.02)	0.17*** (0.02)	0.02 (0.04)
N	1959	1959	1959	1959	1959	1959
Adjusted $R^2$	0.88	0.83	0.89	0.89	0.90	0.91

*Notes.* This table reports results of regressions linking measures of log hours worked (across columns) to log net-of-labor tax rates and log GDP per adult in panel analysis, before (panel A) and after (panel B) controlling for an overall time trend. Estimates can all be interpreted as elasticities of hours worked with respect to net-of-tax rates  $1 - \tau_L$  or GDP per adult. Regressions are weighted by adult population size in each country to be representative. In Panel B, we add a time trend to each regression (coefficients not displayed) to absorb the secular increase in female hours—and corresponding decrease for men. Labor tax rates depress hours of work although the elasticity is somewhat smaller than in the cross-sectional analysis of Table 7, Panel A. The elasticity of hours with respect to  $1 - \tau_L$  is generally much higher than the elasticity of hours with respect to GDP per adult, consistent with income effects in the standard labor supply model (see Appendix D). Without a time trend, the elasticity is large and positive for men but negative for women, reflecting the symmetric evolution of male and female hours and the fact that labor taxes tend to increase over time. With a time trend, the elasticity remains positive for prime-age men while it becomes positive but insignificant for women. Unweighted regressions are presented in Appendix Table B6.

Table A11: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations, Including Pension Spending

	(1)	(2)	(3)	(4)	(5)	(6)
	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours Men	Prime-Age Hours Women
<b>A. Before Controls</b>						
$\log 1 - \tau(L)$	1.15*** (0.18)	0.83*** (0.17)	0.63*** (0.13)	0.21 (0.13)	0.76*** (0.17)	0.94*** (0.30)
<b>B. Controlling for Social and Pension Spending</b>						
$\log 1 - \tau(L)$	0.88*** (0.22)	0.81*** (0.21)	0.53*** (0.10)	0.28 (0.25)	0.70*** (0.13)	1.26* (0.68)
Social Spending	-0.038*** (0.010)	-0.030*** (0.009)	-0.027*** (0.006)	-0.003 (0.010)	-0.037*** (0.007)	-0.008 (0.021)
Pension Spending	0.002 (0.008)	0.009 (0.008)	0.015** (0.006)	-0.007 (0.010)	0.016** (0.008)	0.010 (0.027)
<b>C. Controlling for Social and Pension Spending and Regulations</b>						
$\log 1 - \tau(L)$	0.41* (0.22)	0.38* (0.21)	0.30** (0.13)	0.07 (0.25)	0.37** (0.15)	0.47 (0.64)
Social Spending	-0.038*** (0.009)	-0.030*** (0.008)	-0.027*** (0.005)	-0.003 (0.010)	-0.037*** (0.007)	-0.008 (0.019)
Pension Spending	0.001 (0.007)	0.009 (0.007)	0.015** (0.006)	-0.007 (0.010)	0.015** (0.007)	0.009 (0.026)
Effective Regulations Index	-0.27*** (0.09)	-0.25*** (0.08)	-0.13*** (0.05)	-0.13 (0.08)	-0.19** (0.07)	-0.45** (0.19)
N	108	108	108	108	108	108
Adjusted $R^2$	0.73	0.67	0.69	0.57	0.72	0.69

*Notes.* This table reproduces Table 7, but further controls for pension spending and the elderly population share (coefficient not reported) in panels B and C. The sample covers 99 countries for which all tax, spending, and regulations variables are available. The results are similar to those reported in Table 7. Pension spending is not significantly associated with lower hours of work. Appendix Table B8 reproduces this table without weighting by population size.

Table A12: Elasticities of Prime-Age Hours Worked: By Country Income Group

	All Countries	Low/Lower-Middle Income Countries	Upper-Middle/High Income Countries
<b>Before Controls</b>			
$\log 1 - \tau(L)$	0.867*** (0.155)	1.542*** (0.312)	0.701*** (0.136)
<b>Controlling for Social Spending and Regulations</b>			
$\log 1 - \tau(L)$	0.091 (0.172)	-0.451 (0.668)	-0.031 (0.143)
Social Spending	-0.022** (0.010)	-0.031 (0.027)	-0.023** (0.009)
Effective Regulations Index	-0.304** (0.134)	-1.296*** (0.391)	-0.264*** (0.093)
N	138	62	76
Adjusted $R^2$	0.54	0.53	0.63

*Notes.* This table studies the heterogeneity of results reported in Table 7, column 3 by country income group. It reports estimates of the elasticity of prime-age hours with respect to  $1 - \tau_L$ , before and after controlling for social spending and regulations, for all countries (column 1) and separately for low-income and lower-middle-income countries (column 2) and upper-middle-income and high-income countries (column 3). Labor taxes are negatively correlated with hours of work, but this correlation disappears after controlling for social spending, formal employment, and regulations in both groups of countries. Appendix Table B9 reproduces this table without weighting by population size.

## Appendix B. Regression Results without Population Weights

Table B1: Elasticities of Hours Worked with Respect to GDP per Adult (No Population Weight)

					Prime-Age Men			Prime-Age Women		
	(1) All Adults	(2) Young 15-19	(3) Elderly 60+	(4) Prime-Age 20-59	(5) Hours per Adult	(6) Hours per Worker	(7) Employment Rate	(8) Hours per Adult	(9) Hours per Worker	(10) Employment Rate
<b>Panel A: Cross Section</b>										
Log GDP Per Adult	-0.05*** (0.02)	-0.35*** (0.05)	-0.31*** (0.04)	0.01 (0.01)	-0.03*** (0.01)	-0.05*** (0.01)	0.01 (0.01)	0.08** (0.03)	-0.03** (0.01)	0.10*** (0.03)
Mean Hours	24.7	6.6	12.5	30.7	39.3	45.6	86.3	22.3	37.5	59.6
N	160	159	160	160	160	160	160	160	160	160
Adjusted $R^2$	0.04	0.21	0.31	-0.01	0.04	0.13	0.01	0.03	0.03	0.06
<b>Panel B: Panel Data</b>										
Log GDP Per Adult	-0.02*** (0.01)	-0.91*** (0.04)	0.20*** (0.03)	0.03*** (0.01)	-0.09*** (0.01)	-0.13*** (0.00)	0.03*** (0.00)	0.24*** (0.01)	-0.12*** (0.01)	0.35*** (0.01)
Mean Hours	22.3	8.1	9.3	28.5	36.3	43.4	83.7	21.0	36.1	58.9
N	2,162	2,139	2,162	2,162	2,162	2,162	2,162	2,162	2,162	2,162
Within $R^2$	0.00	0.23	0.03	0.01	0.07	0.28	0.02	0.21	0.18	0.36

*Notes.* This table reproduces Table 2 but without weighting countries by population size.

Table B2: Elasticities of Hours Worked with Respect to GDP per Adult, with Squared Term (No Population Weight)

	(1)	(2)	(3)	(4)	Prime-Age Men			Prime-Age Women		
					(5)	(6)	(7)	(8)	(9)	(10)
	All Adults	Young 15-19	Elderly 60+	Prime-Age 20-59	Hours per Adult	Hours per Worker	Employment Rate	Hours per Adult	Hours per Worker	Employment Rate
Log GDP Per Adult	0.08 (0.27)	-2.31*** (0.87)	-0.24 (0.62)	0.11 (0.23)	0.36* (0.20)	0.60*** (0.14)	-0.26* (0.14)	-0.10 (0.56)	0.90*** (0.18)	-1.00* (0.52)
Log GDP per Adult Squared	-0.01 (0.01)	0.10** (0.04)	-0.00 (0.03)	-0.01 (0.01)	-0.02* (0.01)	-0.03*** (0.01)	0.01* (0.01)	0.01 (0.03)	-0.05*** (0.01)	0.06** (0.03)
Mean Hours	24.7	6.6	12.5	30.7	39.3	45.6	86.3	22.3	37.5	59.6
N	160	159	160	160	160	160	160	160	160	160
Adjusted $R^2$	0.04	0.23	0.31	-0.01	0.05	0.23	0.02	0.03	0.16	0.08

*Notes.* This table reproduces Table A3 but without weighting countries by population size.

Table B3: Log Hours Worked by the Young (No Population Weight)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.35*** (0.05)		-0.00 (0.05)	0.15** (0.07)
Young School Attendance		-4.03*** (0.29)	-4.02*** (0.38)	-3.52*** (0.38)
Employment: Agriculture				0.96*** (0.37)
Employment: Manufacturing				-1.38* (0.71)
Mean Hours	7.2	7.2	7.2	7.2
N	149	149	149	149
Adjusted $R^2$	0.22	0.56	0.56	0.60

*Notes.* This table reproduces Table 3 but without weighting countries by population size.

Table B4: Log Hours Worked by the Elderly (No Population Weight)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.44*** (0.05)		-0.15** (0.08)	0.00 (0.09)
Pension Spending		-5.90*** (1.61)	-6.20*** (1.59)	-5.76*** (1.50)
Elderly Population Share		-0.13 (0.79)	0.85 (0.92)	0.57 (0.93)
Pension Coverage		-0.84*** (0.19)	-0.71*** (0.20)	-0.42** (0.19)
Employment: Agriculture				1.25*** (0.40)
Employment: Manufacturing				-0.45 (0.71)
Mean Hours	11.8	11.8	11.8	11.8
N	92	92	92	92
Adjusted $R^2$	0.47	0.63	0.64	0.70

*Notes.* This table reproduces Table 4 but without weighting countries by population size.

Table B5: Log Hours Worked by Prime-Age Women (No Population Weight)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	0.10*** (0.04)		0.03 (0.04)	0.24*** (0.05)
Muslim/Hindu Share		-0.67*** (0.09)	-0.65*** (0.09)	-0.56*** (0.08)
Former Communist Country		0.18** (0.09)	0.18** (0.09)	0.21** (0.08)
% Women Living with Young Children		0.11 (0.18)	0.23 (0.23)	-0.03 (0.20)
Employment: Agriculture				1.20*** (0.25)
Employment: Manufacturing				-0.92* (0.55)
Mean Hours	22.0	22.0	22.0	22.0
N	134	134	134	134
Adjusted $R^2$	0.05	0.34	0.34	0.50

*Notes.* This table reproduces Table 5 but without weighting countries by population size.

Table B6: Elasticities of Hours Worked with Respect to Net-of-Tax Rates: Panel Data (No Population Weight)

**A. Without Time Trend**

	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours, Men	Prime-Age Hours, Women
$\log 1 - \tau(L)$	0.57*** (0.04)	0.31*** (0.03)	0.30*** (0.03)	0.03 (0.03)	0.63*** (0.04)	-0.21*** (0.06)
Log GDP Per Adult	0.01 (0.01)	0.04*** (0.01)	-0.13*** (0.01)	0.15*** (0.01)	-0.06*** (0.01)	0.22*** (0.01)
N	1959	1959	1959	1959	1959	1959
Adjusted $R^2$	0.89	0.85	0.88	0.90	0.85	0.89

**B. With Time Trend**

	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours, Men	Prime-Age Hours, Women
$\log 1 - \tau(L)$	0.41*** (0.04)	0.25*** (0.04)	0.11*** (0.03)	0.16*** (0.03)	0.28*** (0.04)	0.25*** (0.06)
Log GDP Per Adult	0.09*** (0.01)	0.07*** (0.01)	-0.03*** (0.01)	0.08*** (0.01)	0.12*** (0.01)	-0.02 (0.02)
N	1959	1959	1959	1959	1959	1959
Adjusted $R^2$	0.89	0.85	0.90	0.91	0.89	0.91

Notes. This table reproduces Table A10 but without weighting countries by population size.

Table B7: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations (No Population Weight)

	(1)	(2)	(3)	(4)	(5)	(6)
	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours Men	Prime-Age Hours Women
<b>A. Before Controls</b>						
$\log 1 - \tau(L)$	0.70*** (0.10)	0.41*** (0.09)	0.54*** (0.05)	-0.13 (0.10)	0.46*** (0.07)	0.44** (0.22)
Log GDP Per Adult	-0.01 (0.02)	0.01 (0.02)	0.02** (0.01)	-0.01 (0.02)	0.01 (0.01)	0.04 (0.05)
<b>B. Controlling for Social Spending</b>						
$\log 1 - \tau(L)$	0.64*** (0.11)	0.34*** (0.09)	0.41*** (0.06)	-0.07 (0.10)	0.36*** (0.09)	0.40* (0.22)
Log GDP Per Adult	-0.01 (0.02)	0.02 (0.02)	0.03** (0.01)	-0.02 (0.02)	0.01 (0.01)	0.04 (0.05)
Social Spending	-0.005 (0.006)	-0.006 (0.006)	-0.012*** (0.003)	0.006 (0.007)	-0.009 (0.005)	-0.004 (0.011)
<b>C. Controlling for Social Spending and Regulations</b>						
$\log 1 - \tau(L)$	0.17 (0.16)	0.01 (0.13)	0.25*** (0.07)	-0.22 (0.14)	-0.02 (0.13)	-0.11 (0.29)
Log GDP Per Adult	0.03 (0.02)	0.04* (0.02)	0.04*** (0.01)	-0.01 (0.02)	0.04** (0.02)	0.07 (0.06)
Social Spending	-0.001 (0.007)	-0.003 (0.007)	-0.010*** (0.003)	0.007 (0.007)	-0.006 (0.006)	0.001 (0.011)
Effective Regulations Index	-0.52*** (0.15)	-0.37*** (0.13)	-0.17*** (0.05)	-0.17 (0.13)	-0.42*** (0.12)	-0.57* (0.33)
N	138	138	138	138	138	138
Adjusted $R^2$	0.39	0.23	0.53	0.30	0.35	0.36

Notes. This table reproduces Table 7 but without weighting countries by population size.

Table B8: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations, Including Pension Spending (No Population Weight)

	(1)	(2)	(3)	(4)	(5)	(6)
	Hours Per Adult	Prime-Age Hours Per Adult	Prime-Age Hours Per Worker	Prime-Age Employment Rate	Prime-Age Hours Men	Prime-Age Hours Women
<b>A. Before Controls</b>						
$\log 1 - \tau(L)$	0.63*** (0.13)	0.37*** (0.12)	0.54*** (0.07)	-0.17 (0.12)	0.50*** (0.10)	0.13 (0.22)
<b>B. Controlling for Social and Pension Spending</b>						
$\log 1 - \tau(L)$	0.44** (0.20)	0.35* (0.18)	0.49*** (0.11)	-0.13 (0.19)	0.44*** (0.16)	0.19 (0.34)
Social Spending	-0.006 (0.009)	-0.008 (0.008)	-0.013** (0.005)	0.005 (0.009)	-0.011 (0.008)	0.001 (0.016)
Pension Spending	-0.010 (0.007)	-0.004 (0.007)	0.010** (0.004)	-0.014** (0.007)	0.001 (0.006)	-0.014 (0.013)
<b>C. Controlling for Social and Pension Spending and Regulations</b>						
$\log 1 - \tau(L)$	0.10 (0.22)	0.06 (0.20)	0.33*** (0.12)	-0.26 (0.22)	0.09 (0.18)	-0.06 (0.40)
Social Spending	-0.006 (0.009)	-0.008 (0.008)	-0.013*** (0.005)	0.005 (0.009)	-0.011 (0.007)	0.000 (0.016)
Pension Spending	-0.008 (0.007)	-0.002 (0.006)	0.011*** (0.004)	-0.013* (0.007)	0.003 (0.006)	-0.013 (0.013)
Effective Regulations Index	-0.42*** (0.14)	-0.35*** (0.13)	-0.19** (0.08)	-0.16 (0.14)	-0.43*** (0.12)	-0.31 (0.26)
N	108	108	108	108	108	108
Adjusted $R^2$	0.46	0.28	0.64	0.35	0.40	0.43

Notes. This table reproduces table A11 but without weighting countries by population size.

Table B9: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations, By Country Income Group (No Population Weight)

	All Countries	Low/Lower-Middle Income Countries	Upper-Middle/High Income Countries
<b>Before Controls</b>			
$\log 1 - \tau(L)$	0.409*** (0.091)	1.007*** (0.313)	0.324*** (0.081)
<b>Controlling for Social Spending and Regulations</b>			
$\log 1 - \tau(L)$	0.005 (0.132)	-0.326 (0.396)	0.076 (0.120)
Social Spending	-0.003 (0.007)	-0.020 (0.025)	-0.001 (0.005)
Effective Regulations Index	-0.369*** (0.132)	-1.355*** (0.406)	-0.230** (0.107)
N	138	62	76
Adjusted $R^2$	0.23	0.36	0.15

*Notes.* This table reproduces Table [A12](#) but without weighting countries by population size.

## Appendix C. Additional Methodological Details

How questions on hours worked are asked across surveys and harmonized in the microdata potentially affects the comparability of our estimates. We discuss seven main issues here. In our online full panel database, we include detailed metadata information on the name of each survey, the type of questions on hours worked asked (actual versus usual hours, hours worked at the main job versus at all jobs, and the reference period), and an indicator of the overall quality of each survey. We also report the exact questions asked in the questionnaire for a representative sample of about 250 surveys.

**(a) Actual versus Usual Hours Worked.** We aim to measure total actual hours worked at all jobs in the past week. Unfortunately, some surveys only cover usual hours worked in a typical week. This happens in 23 out of 160 countries in our cross-sectional analysis, and about 10% of surveys in our full panel database. Fortunately, 60 countries in our sample cover information on *both* actual and usual hours, which allows us to investigate the magnitude of the potential bias involved. Appendix Figure C6, panel (a) compares actual versus usual hours per worker in this sample of countries. Usual hours are slightly higher than actual hours in almost all countries. This difference is small, about 6% on average. We find no evidence of heterogeneity in this gap over the course of development.

**(b) Hours Worked at the Main Job versus at All Jobs.** Similarly, 13 countries and about 7% of surveys in our full database only report information on hours worked at the main job. Measures of hours worked for both the main job and all jobs can be constructed for 90 countries, allowing us to better document this source of bias. Appendix Figure C6, panel (b) compares these estimates. The difference between main and all jobs is even smaller than that between usual and actual hours: on average, total hours are about 2% higher than hours in the main job. However, we do find some evidence of heterogeneity with income: this gap ranges from 9% in low-income countries to 1.5% in high-income countries, reflecting the greater prevalence of multiple jobs per worker in poorer countries.

How important are these two discrepancies for the measurement of cross-country differences in hours worked? We investigate this in Appendix Figure C6, panel (c) by using a simple adjustment method to improve comparability of estimates across countries. 33 countries in our sample either measure usual hours at all jobs, actual hours at the main job, or usual hours at the main job. We adjust these estimates by using the correction factors estimated above. Usual hours are reduced by 6%, while hours at the main job are increased by 1.5% (high-income countries) to 9% (low-income countries) in order to reach estimates that proxy for actual hours worked at all jobs. As shown in Appendix Figure C6, panel (c), applying this correction makes very little difference to the overall pattern of hours worked over the course of development. The estimated elasticity with respect to GDP per adult is identical. It also does not lead to significant rerankings in terms of which countries work longer hours than others.

**(c) Recall Periods.** Recall periods are a third potential issue. The international standard for labor force surveys is to ask about employment and hours worked in the past week. Fortunately, only 6 countries in our cross-sectional database relied on monthly (2 countries) or yearly (4 countries) recalls. Non-weekly recalls also account for only 2% of surveys in our panel database. The existing literature provides mixed evidence but suggests that seasonal or yearly recalls may in some cases bias estimates of labor force participation, while very short recall windows do not generally improve measurement (Ambler et al. 2026; Gaddis et al. 2021; Heath et al. 2021).

The largest country with a non-weekly recall period is China, where only information on hours worked in the past year is available in the China Household Income Project. To investigate the potential biases associated with this questionnaire, we compared our estimates with those of two other Chinese surveys, the China Family Panel Studies and the China Labor-Force Dynamics Survey, both of which asked about weekly usual hours worked. We find that estimates of working hours are very similar across these three sources, reaching 30-31 weekly hours per adult, with little discrepancy by age and gender. We take this as reassuring evidence that recall periods are of second-order importance for the results presented in this paper.<sup>25</sup>

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<sup>25</sup>The CFPS and CLDS provide less detailed labor market information than the CHIP, which is why we do not use them as our main source.

**(d) Proxy Respondents.** A fourth important issue relates to proxy respondents. The existing literature suggests that proxy respondents tend to report hours worked less accurately, especially for informal jobs where hours can vary from week to week. However, this bias can be alleviated by asking detailed prompts on informal activities (Abraham and Amaya 2019; Abraham et al. 2024; Bardasi et al. 2011).

Fortunately, almost all the surveys used in this paper ask detailed employment questions, particularly in low- and middle-income countries, where surveys typically ask five to ten different questions in order to capture all potential forms of employment. As an illustrative example, the Ghana 2018 Living Standards Survey asked:

During the past 7 days, did [NAME]:

1. Work for a wage, salary, commission, or other pay (incl. in kind) for someone who is not a member of your household (e.g. an enterprise, the government, another individual), for at least an hour?
2. Work as a domestic worker for a wage, salary, commission or any payment in cash or in kind for someone who is a member of your household, for at least an hour?
3. Work on a farm owned or rented by a member of your household, either in cultivating crops or in other farming tasks, such as raising livestock or fishing, for at least an hour?
4. Run/manage a non-farm enterprise of any size owned by the household?
5. Help/work in a non-farm enterprise of any size owned by someone in the household, for at least an hour?
6. Catch fish, prawns, wildlife or collect any other food for sale or own use for at least one hour?
7. Work as an apprentice even if it was for at least one hour?
8. Do any voluntary work for someone who is not a member of [NAME's] household, without any pay for at least one hour?

Unfortunately, information on the prevalence of proxy respondents is typically unavailable and scarcely reported by statistical institutes fielding the surveys exploited in this paper. Given the high level of detail in employment questions used in almost all of the surveys exploited in this paper, however, this bias is likely to be limited.

**(e) Non-Response.** A fifth potential issue relates to non-response rates. Unfortunately, information on non-response is generally not reported by survey designers, so it is not possible to systematically document household non-response rates for all surveys in our database. However, to better investigate this issue, we have searched for non-response rates reported in official reports for a selection of surveys fielded in large developing countries. Non-response is typically low in these surveys. For instance, response rates in recent surveys reached 97% in the Democratic Republic of the Congo (2012), 99% in India (2022), 96% in Indonesia (2021), 86% in Mexico (2019), and 99% in Pakistan (2018).

**(f) New Employment Definition.** Sixth, we exclude from our database surveys fielded in countries with large agricultural sectors where the definition of employment excludes subsistence agricultural work. We identified these surveys by checking questionnaires and visually inspecting trends in prime-age employment rates by gender. In a number of countries, such as Rwanda or Zimbabwe, prime-age employment collapses around the middle of the 2010s, reflecting the adoption of the new definition. We systematically exclude these surveys from the analysis. Appendix Table C2 provides a list of these surveys.

It is important to mention that not all recent surveys prevent researchers from using our preferred employment definition. Indeed, many recent surveys still ask respondents about work in subsistence agriculture. The new definition of employment is then typically constructed by statistical institutes *ex post* by filtering out individuals who declare that this work was mainly for own consumption rather than for profit. For these surveys, it is still possible to estimate our preferred measure of employment and hours worked. For other recent surveys, however, the construction of this broader measure is not possible due to the absence of questions on subsistence agricultural work. These are the surveys that we exclude from our analysis.

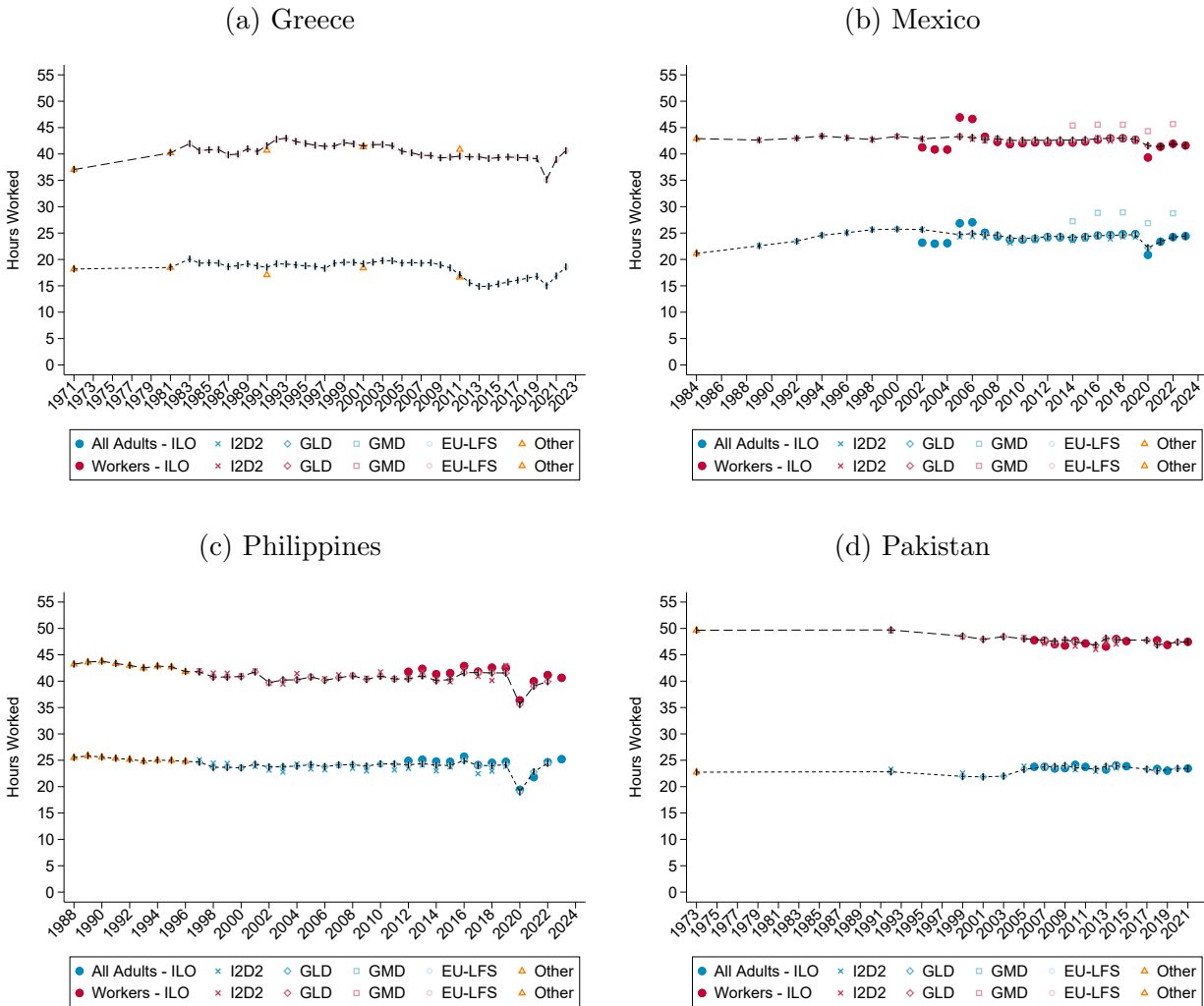
**(g) Comparability across Data Providers.** Lastly, there are sometimes discrepancies in estimates of hours worked reported in the six sets of sources that we combine (see Section 2.1). The ILO provided us with on-request detailed tabulations on hours worked from their harmonized microdatabase, while for the I2D2 database we have access to both raw microdata and questionnaires and the codes used to transform them into harmonized microfiles. The GMD, GLD, and EU-LFS are also available in the form of harmonized microfiles.

For the many country-years covered by two or more of these datasets, we have systematically compared estimates of hours worked and employment over time and across sources. They generally align very well, but there are cases where they can differ. For these cases, we have made further efforts to check the ILO and World Bank estimates by going back to the raw microdata and questionnaires and reconstructing measures of employment and hours worked from scratch. We did this for many countries, especially low- and middle-income countries such as Burkina Faso, the Central African Republic, the Democratic Republic of the Congo, Ethiopia, the Gambia, Guinea, Guinea-Bissau, Iraq, Lao, Liberia, Madagascar, Mali, Niger, Sudan, Togo, and Yemen. In a few cases, such as the Gambia and Sudan, we were more satisfied with our own harmonization, so we use our own version of the survey in the paper.

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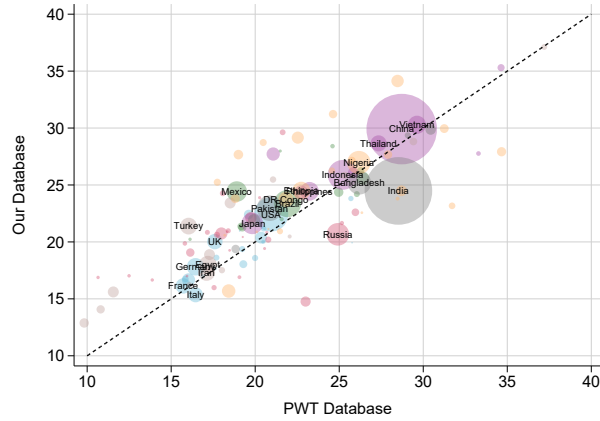
Figure C1: Data Harmonization Examples



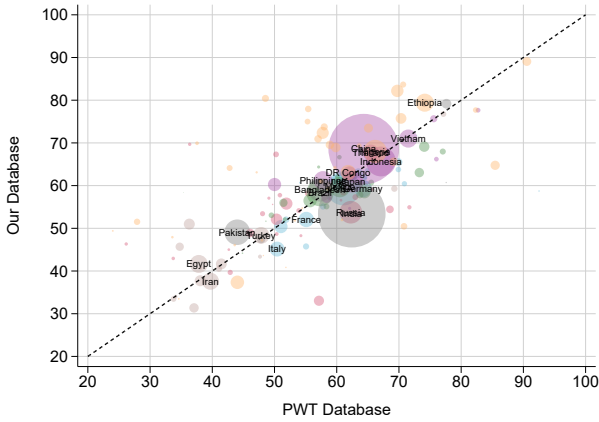
*Notes:* This figure plots the evolution of hours per adult (blue) and hours per worker (red) by data source in Greece, Mexico, the Philippines, and Pakistan, together with the selected series that are used in the final database (black dashed lines). I2D2: World Bank I2D2 survey microdatabase. GMD: World Bank Global Monitoring Database. GLD: World Bank Global Labor Database. ILO: International Labour Organization labor force survey microdatabase. EU-LFS: European Union Labor Force Surveys. Other: other country-specific microdata sources (IPUMS International census microdata for Greece and Pakistan, country-specific household surveys harmonized by the authors for Mexico and the Philippines). The 2020 dip is due to COVID.

Figure C2: Comparison with Penn World Tables

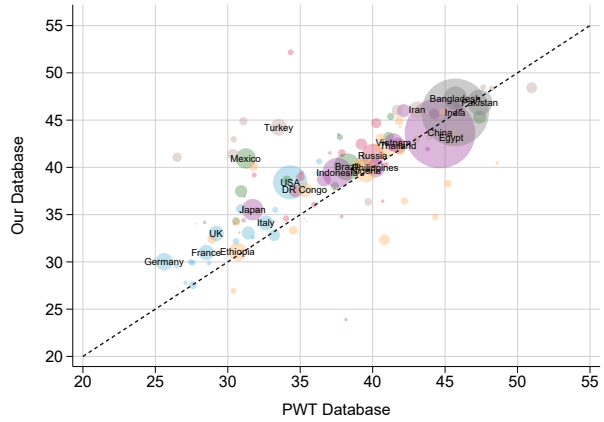
(a) Hours per Adult



(b) Employment Rate



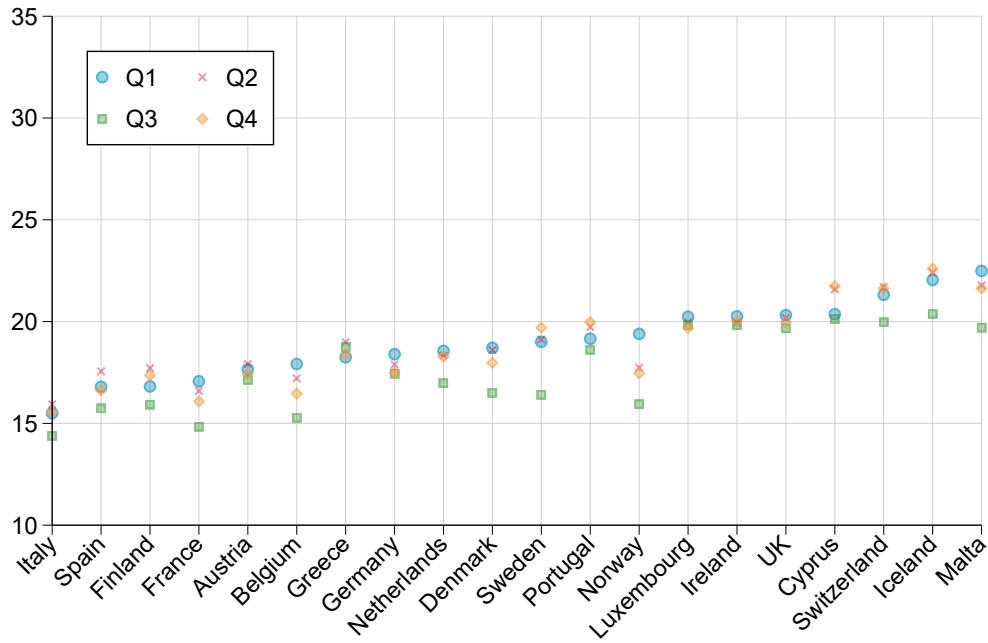
(c) Hours per Worker



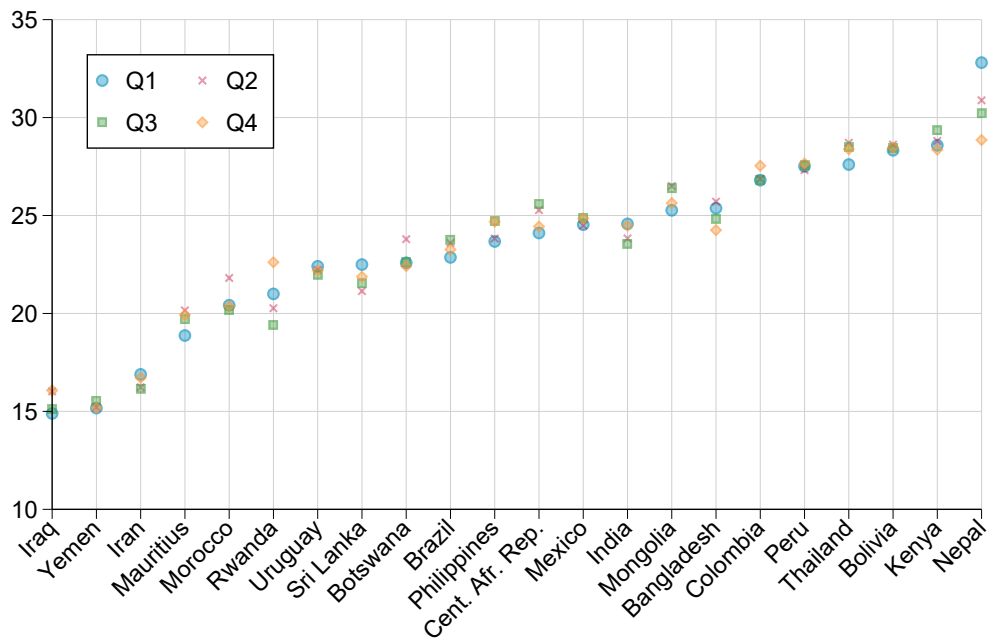
*Notes:* This figure compares estimates of weekly hours worked per adult (panel (a)), the employment rate (panel (b)), and hours per worker (panel (c)) in our database and in the Penn World Tables (sourced from the Conference Board Total Economy database). Estimates of hours per adult are calculated by multiplying hours per worker by the employment rate in the PWT. PWT estimates are positively correlated with our estimates for all three measures, although there are large gaps in measures of hours worked in a number of countries. The correlation coefficients are 0.79 for hours per adult, 0.67 for employment rates, and 0.72 for hours per worker.

Figure C3: Seasonality in Hours Worked in Western Europe and Developing Countries

(a) Western Europe

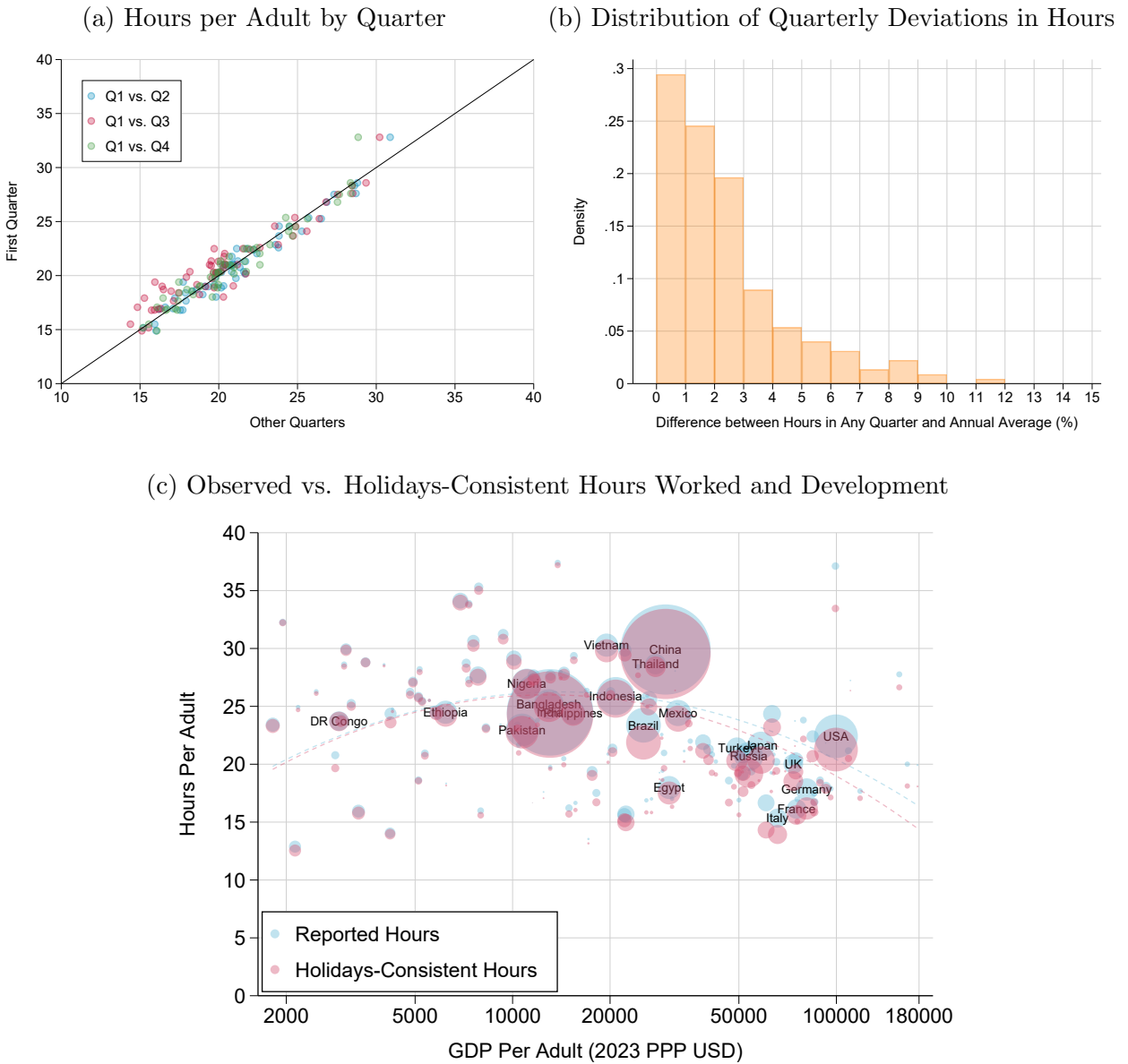


(b) Developing Countries



Notes: The figure depicts average hours of work per adult (aged 15+) by quarter in Western Europe (panel (a)) and developing countries (panel (b)), based on labor force surveys fielded over the entire year. Hours worked in Western Europe are generally lower in the third quarter, corresponding to the summer holidays. Seasonality is much smaller in developing countries. In both Western Europe and developing countries, cross-country variations in hours worked are similar across quarters. Hence, using data from a given quarter has limited impact on estimates of which countries have the highest and lowest hours.

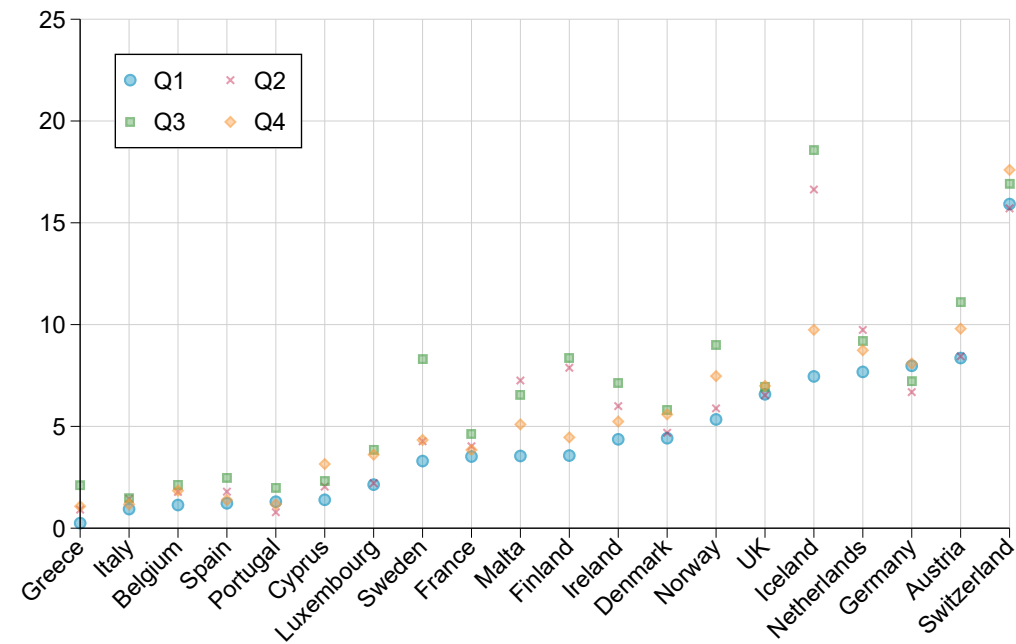
Figure C4: Seasonality in Hours Worked



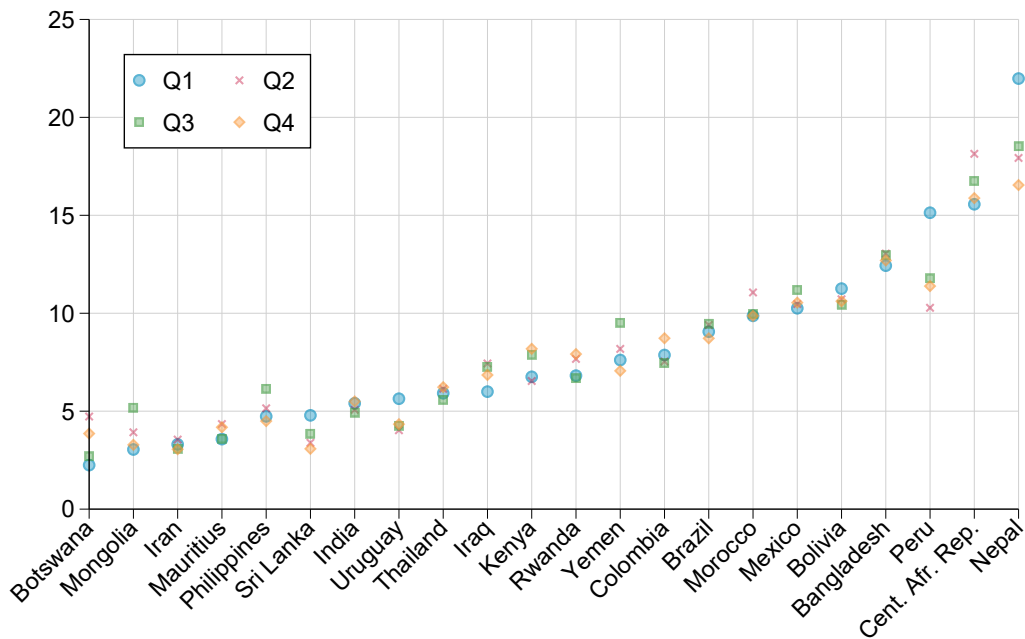
Notes: Panels (a) and (b) compare hours per adult observed across quarters, based on 224 nationally representative surveys that were fielded in 56 countries throughout the year and provide information on the quarter of interview. Panel (a) compares hours per adult aged 15+ in the first quarter versus other quarters across surveys. Panel (b) plots the distribution of quarterly deviations from annual average hours per adult observed across surveys. Panel (c) compares estimates of hours worked by country before—as in our benchmark estimates of Figure 2(a)—versus after making the share of workers with zero hours consistent with legal paid annual leave time in each country. We construct holidays-consistent hours as follows. For Europe and the United States, we correct our series using data from Bick, Brüggemann, and Fuchs-Schündeln (2019), who adjust hours reported in survey data using information on holidays from external sources. For other countries, we estimate adjusted hours as:  $h_{adj} = (1/52.14) \times \left[ \left( \text{formal} \times e \times h \times \left( 52.14 - \frac{\text{leave}}{5} \right) \right) + \left( (1 - \text{formal}) \times e \times h \times 52.14 \right) \right]$  where *formal* is the share of formal employment, *e* is the employment rate, *h* is weekly hours per worker, and *leave* is average paid annual leave measured in days (52.14 reflects that one year of 365 days has 52.14 weeks). This formula amounts to assuming that all workers in the formal sector took the average paid annual leave prevailing in their country in the past year. To get an upper bound on this adjustment, we include workers with zero hours in the calculation of *h*, which is equivalent to assuming that zeros in our data are not due to holidays. Results excluding zeros are similar and imply a smaller adjustment in all countries. The best quadratic fit (with countries weighted by population) is depicted in dashed lines.

Figure C5: Seasonality in Hours Worked by the Young (15-19)

(a) Western Europe

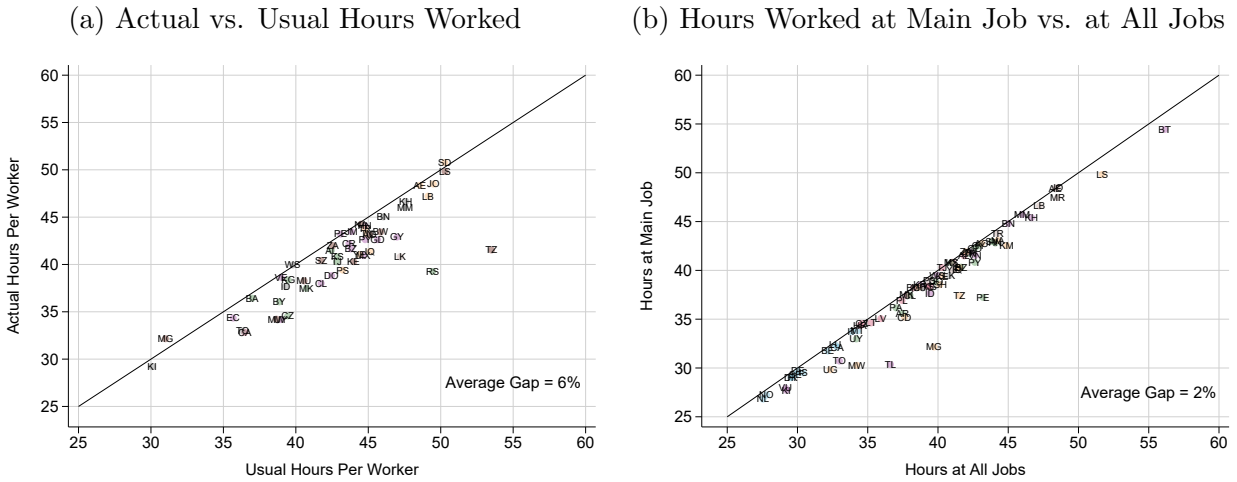


(b) Developing Countries

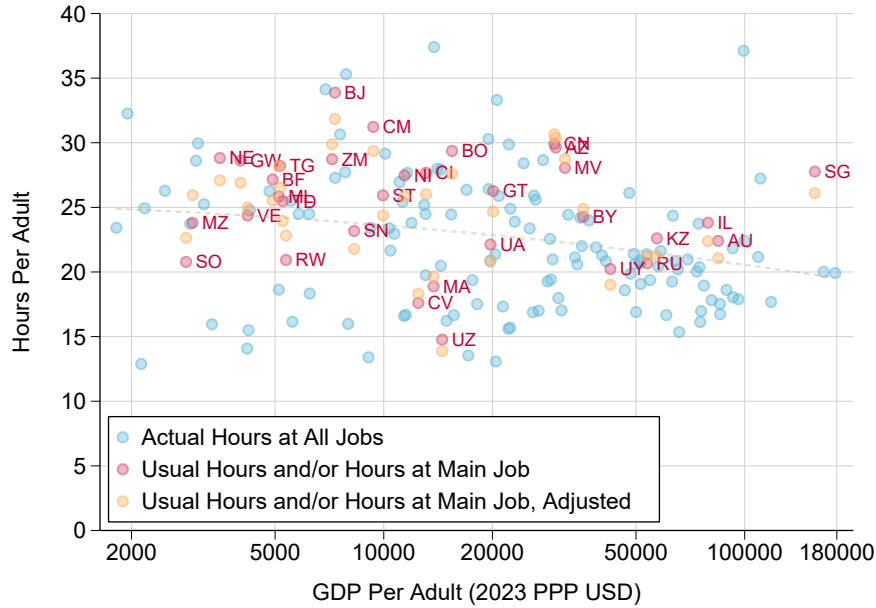


Notes: This figure reproduces Figure C3 but focuses on seasonal variations in hours worked by the young aged 15-19. There are significant increases in young hours of work in many Western European countries during the third quarter of the year. Seasonal fluctuations in hours worked by the young are typically smaller in developing countries.

Figure C6: Hours Worked by Measurement Concept



(c) Unadjusted vs. Conceptually Adjusted Hours and GDP per Adult



*Notes:* This figure compares estimates of hours worked for different measurement concepts. Panel (a) compares estimates of average actual and usual hours worked per adult in the past week across the set of recent surveys for which both measures are available. Panel (b) compares estimates of weekly hours worked at the main job and weekly hours worked at all jobs across the set of recent surveys for which both measures are available. Drawing on the results displayed in panels (a) and (b), panel (c) shows estimates of hours per adult for actual hours, usual hours and/or hours at the main job, and adjusted estimates that convert all measures into actual hours worked at all jobs against GDP per adult in 2023 PPP USD. Accounting for conceptual discrepancies in the measurement of hours worked has little impact on estimates of cross-country variations in hours worked and their relationship with development.

Table C1: Data Sources and Coverage of Auxiliary Variables

Country	Source	Survey	Last Survey Year	Industry	School Attendance	Household Structure	Pension Coverage	Pension Spending	Tax Rates	Public Spending
Afghanistan	ILO	HIES	2017	x	x	x	x		x	x
Albania	ILO	LFS	2023	x	x	x	x	x	x	x
Angola	ILO	LFS	2022	x	x	x	x	x		x
Argentina	ILO	LFS	2023	x	x	x	x	x	x	x
Armenia	GLD	LFS	2022	x	x	x	x	x	x	x
Australia	Other	LIS	2018	x	x	x		x	x	x
Austria	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Azerbaijan	I2D2	AMSSW	2015	x		x		x	x	x
Bangladesh	GLD	QLFS	2022	x	x	x	x	x	x	x
Belarus	ILO	LFS	2023	x	x		x		x	x
Belgium	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Belize	ILO	LFS	2019	x	x	x			x	x
Benin	ILO	HIES	2022	x	x		x	x	x	x
Bhutan	ILO	LFS	2022	x	x	x	x	x		x
Bolivia	ILO	HIES	2019	x	x	x	x	x	x	x
Bosnia-Herz.	ILO	LFS	2023	x	x	x	x		x	x
Botswana	ILO	HS	2023	x	x	x	x	x	x	x
Brazil	GLD	PNADC	2022	x	x	x	x	x	x	x
Brunei D.	ILO	LFS	2023	x	x	x				x
Bulgaria	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Burkina Faso	ILO	HIES	2022	x	x		x	x	x	x
Burundi	ILO	HIES	2014	x	x	x			x	x
Cabo Verde	ILO	LFS	2015	x	x	x	x	x		x
Cambodia	ILO	LFS	2019	x	x	x		x	x	x
Cameroon	ILO	HS	2014	x	x	x	x	x	x	x
Canada	ILO	LFS	2023	x	x			x	x	x
Cent. Afr. Rep.	I2D2	ECASEB	2008	x	x	x		x	x	x
Chad	ILO	HIES	2018	x	x	x	x	x	x	x
Chile	ILO	LFS	2023	x	x	x	x	x	x	x
China	Other	CHIP	2018	x	x	x	x	x	x	x
Colombia	GMD	GEIH	2022	x	x	x	x	x	x	x
Comoros	ILO	LFS	2014	x	x	x	x			x
Costa Rica	ILO	LFS	2023	x	x	x	x	x	x	x
Cote d'Ivoire	ILO	HIES	2022	x	x	x	x	x	x	x
Croatia	EU-LFS	EU-LFS	2022	x	x	x	x		x	x
Cyprus	EU-LFS	EU-LFS	2022	x	x	x	x		x	x

Czech Republic	ILO	LFS	2023	x	x	x	x	x	x	x
DR Congo	ILO	LFS	2012	x	x	x		x	x	x
Denmark	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Djibouti	I2D2	EDAM	2012	x	x	x	x			x
Dominican Rep.	ILO	LFS	2023	x	x	x	x	x	x	x
Ecuador	ILO	LFS	2023	x	x	x	x	x	x	x
Egypt	ILO	LFS	2023	x	x	x		x	x	x
El Salvador	ILO	HS	2023	x	x	x	x	x	x	x
Estonia	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Ethiopia	GLD	LFS	2013	x	x	x		x	x	x
Finland	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
France	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Gabon	I2D2	EGEP	2017	x	x	x	x	x	x	x
Gambia	Other	IHS	2015	x	x	x	x	x	x	x
Georgia	GLD	LFS	2022	x		x	x		x	x
Germany	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Ghana	ILO	HIES	2017	x	x	x	x	x	x	x
Greece	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Grenada	ILO	LFS	2023	x	x					
Guatemala	ILO	LFS	2019	x	x	x	x	x	x	x
Guinea	I2D2	ELEP	2012	x	x	x	x		x	x
Guinea-Bissau	ILO	HIES	2022	x	x			x		x
Guyana	ILO	LFS	2019	x	x	x			x	x
Haiti	ILO	HIES	2012	x	x	x	x		x	x
Honduras	ILO	HS	2023	x	x	x	x	x	x	x
Hungary	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Iceland	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
India	ILO	LFS	2023	x	x	x	x	x	x	x
Indonesia	ILO	LFS	2023	x	x	x	x	x	x	x
Iran	ILO	LFS	2023	x	x			x	x	x
Iraq	ILO	HIES	2012		x	x	x	x		x
Ireland	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Israel	Other	LIS	2019	x				x	x	x
Italy	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Jamaica	ILO	LFS	2023	x	x	x		x	x	x
Japan	ILO	LFS	2022	x				x	x	x
Jordan	ILO	LFS	2023	x	x	x	x	x	x	x
Kazakhstan	Other	LITS	2016			x	x		x	x
Kenya	ILO	HIES	2016		x	x	x	x	x	x
Kiribati	ILO	HIES	2023	x	x					
Korea	ILO	LFS	2023	x	x			x	x	x
Kosovo	ILO	LFS	2023	x	x	x	x	x	x	x
Kyrgyzstan	ILO	LFS	2023	x	x		x	x	x	x
Lao PDR	ILO	LFS	2010	x	x	x	x	x	x	x
Latvia	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Lebanon	ILO	LFS	2019	x	x	x		x	x	x

Lesotho	ILO	LFS	2019	x	x		x	x	x	x
Liberia	Other	HIES	2016	x	x	x		x	x	x
Lithuania	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Luxembourg	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Macedonia	ILO	LFS	2023	x	x			x	x	x
Madagascar	Other	ENSOMD	2012	x	x	x			x	x
Malawi	ILO	LFS	2013	x	x	x	x	x	x	x
Malaysia	Other	I2D2	2010	x	x	x		x	x	x
Maldives	ILO	HIES	2019	x	x	x	x	x		x
Mali	ILO	LFS	2023	x	x	x	x		x	x
Malta	ILO	LFS	2023	x	x	x	x	x		x
Mauritania	ILO	HIES	2019	x	x	x		x	x	x
Mauritius	ILO	LFS	2023	x	x	x	x		x	x
Mexico	ILO	LFS	2023	x	x	x	x	x	x	x
Moldova	ILO	LFS	2023	x	x	x	x		x	x
Mongolia	GLD	LFS	2022	x	x	x	x	x	x	x
Montenegro	ILO	LFS	2023	x	x	x	x	x		x
Morocco	GLD	ENE	2018	x	x	x		x	x	x
Mozambique	ILO	HIES	2022	x	x		x	x	x	x
Myanmar	ILO	LFS	2019	x	x	x	x	x	x	x
Namibia	ILO	LFS	2018	x	x	x	x	x	x	x
Nepal	GLD	LFS	2008	x	x	x	x	x	x	x
Netherlands	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Nicaragua	ILO	HIES	2014	x	x	x	x	x	x	x
Niger	ILO	HIES	2022	x	x	x	x		x	x
Nigeria	ILO	HIES	2019	x	x	x	x	x	x	x
Norway	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Pakistan	GLD	LFS	2018	x	x	x	x	x	x	x
Palestine	ILO	LFS	2022	x	x	x	x	x		x
Panama	ILO	LFS	2023	x	x	x	x	x	x	x
Paraguay	ILO	HS	2023	x	x	x	x		x	x
Peru	ILO	LFS	2023	x	x	x	x	x	x	x
Philippines	GLD	LFS	2022	x	x	x	x	x	x	x
Poland	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Portugal	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Rep. Congo	GMD	ECOM	2011	x	x	x			x	x
Romania	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Russia	Other	RLMS	2019	x	x	x	x		x	x
Rwanda	I2D2	EICV-V	2016	x	x	x	x		x	x
Samoa	ILO	LFS	2022	x	x	x			x	
Sao T. & P.	I2D2	IOF	2017	x	x	x	x			x
Senegal	ILO	HIES	2022	x	x		x	x	x	x
Serbia	ILO	LFS	2023	x	x	x	x	x	x	x
Sierra Leone	GLD	LFS	2014	x	x	x	x		x	x
Singapore	ILO	LFS	2023	x	x				x	x
Slovakia	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x

Slovenia	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Somalia	Other	HFS	2017	x	x	x				x
South Africa	ILO	LFS	2023	x	x	x	x	x	x	x
Spain	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Sri Lanka	ILO	LFS	2022	x	x	x	x	x	x	x
Sudan	Other	SLMPS	2022	x	x	x			x	x
Suriname	ILO	HIES	2016	x	x	x				x
Swaziland	ILO	LFS	2023	x	x	x	x	x	x	x
Sweden	EU-LFS	EU-LFS	2022	x	x	x	x	x	x	x
Switzerland	EU-LFS	EU-LFS	2022	x	x		x	x	x	x
Syria	I2D2	HIES	2003	x	x	x			x	x
Tajikistan	ILO	LFS	2016	x	x	x		x		x
Tanzania	ILO	LFS	2014	x	x				x	x
Thailand	ILO	LFS	2023	x	x	x	x	x	x	x
Timor-Leste	ILO	LFS	2016	x	x	x			x	x
Togo	ILO	HIES	2022	x	x		x	x	x	x
Tonga	ILO	LFS	2023	x	x	x	x			x
Tunisia	ILO	LFS	2019	x	x	x		x	x	x
Turkey	ILO	LFS	2023	x	x	x	x	x	x	x
UK	EU-LFS	EU-LFS	2019	x		x	x	x	x	x
USA	Other	CPS	2023	x	x	x	x	x	x	x
Uganda	ILO	HIES	2019	x	x	x	x	x	x	x
Ukraine	Other	LITS	2016			x	x	x	x	x
UAE	ILO	LFS	2023	x	x					x
Uruguay	ILO	LFS	2023	x	x	x	x	x	x	x
Uzbekistan	Other	LITS	2016			x		x	x	x
Vanuatu	ILO	HIES	2019	x	x	x				
Venezuela	ILO	LFS	2017	x	x	x			x	x
Vietnam	ILO	LFS	2023	x	x	x	x	x	x	x
Yemen	ILO	LFS	2014	x	x	x	x		x	x
Zambia	GLD	LFS	2012	x		x	x	x	x	x
Zimbabwe	GLD	LFS	2011	x	x	x			x	x

*Notes.* This table reports data sources and coverage of auxiliary variables for each of the 160 countries in our recent cross-sectional data covering 97% of the world adult population. Sources: GLD, I2D2, and GMD are from the World Bank. ILO: International Labour Organization. Other: own survey harmonization. Survey acronyms: AMSSW = Azerbaijan Monitoring Survey for Social Welfare, CHIP = China Household Income Project, CPS = Current Population Survey, ECASEB = Enquête Centrafricaine pour le Suivi-Evaluation du Bien-être, ECOM = Enquête sur l'Emploi et le Secteur Informel au Congo, EDAM = Enquête Djiboutienne Auprès des Ménages, EGEP = Enquête Gabonaise pour l'Evaluation et le Suivi de la Pauvreté, EICV-V = Integrated Household Living Conditions Survey, ELEP = Enquête Légère pour l'Evaluation de la Pauvreté, ENE = Enquête Nationale sur l'Emploi, ENSOMD = Enquête Nationale Sur le Suivi des Objectifs du Millénaire pour le Développement, EU-LFS = European Union Labor Force Survey, GEIH = Great Integrated Household Survey, HFS = High Frequency Survey, HIES = Household Income and Expenditure Survey, HS = Household Survey, IOF = Inquerito aos Orcamentos Familiares, IHS = Integrated Household Survey, LFS = Labor Force Survey, LIS = Luxembourg Income Study, LITS = Life in Transition Survey, PNADC = Continuous National Household Sample Survey, QLFS = Quarterly Labor Force Survey, RLMS = Russia Longitudinal Monitoring Survey, SLMPS = Sudan Labor Market Panel Survey. Last Survey Year: most recent available year (excluding COVID years 2020-2021), used in all our cross-sectional analysis. Tax rates variables are from Bachas et al. (2026). Public spending variables are from Gethin (2025a).

Table C2: Surveys Excluded Due to the Use of Restrictive Employment Definitions

Country	Year	Survey
Burkina Faso	2018	Regional Integrated Survey on Employment and the Informal Sector
Burkina Faso	2019	Harmonized Survey on Household Living Conditions
Burkina Faso	2022	Harmonized Survey on Household Living Conditions
Burkina Faso	2023	Regional Integrated Survey on Employment and the Informal Sector
Gambia	2023	Labour Force Survey
Iraq	2021	Labour Force Survey
Lao PDR	2017	Labour Force Survey
Lao PDR	2022	Labour Force Survey
Liberia	2017	Labour Force Survey
Madagascar	2022	Periodic Household Survey
Malawi	2017	Integrated Household Survey
Malawi	2020	Integrated Household Survey
Nepal	2017	Labour Force Survey
Rwanda	2017	Integrated Household Survey on Living Conditions
Rwanda	2017	Labour Force Survey
Rwanda	2018	Labour Force Survey
Rwanda	2019	Labour Force Survey
Rwanda	2020	Labour Force Survey
Rwanda	2021	Labour Force Survey
Rwanda	2022	Labour Force Survey
Rwanda	2023	Labour Force Survey
Sierra Leone	2018	Integrated Household Survey
Timor-Leste	2021	Labour Force Survey
Timor-Leste	2022	Population Census
Zambia	2015	Living Conditions Monitoring Survey
Zambia	2017	Labour Force Survey
Zambia	2018	Labour Force Survey
Zambia	2019	Labour Force Survey
Zambia	2020	Labour Force Survey
Zambia	2021	Labour Force Survey
Zambia	2022	Labour Force Survey
Zambia	2023	Labour Force Survey
Zimbabwe	2019	Labour Force Survey
Zimbabwe	2021	Labour Force Survey
Zimbabwe	2022	Labour Force Survey
Zimbabwe	2023	Labour Force Survey

*Notes.* This table reports the list of surveys excluded from our database due to the use of the post-2013 ICLS employment definition, which excludes subsistence agriculture.

## Appendix D. Labor Supply Model

In this appendix, we discuss the predictions of the standard static labor supply model on how hours of work vary with the wage rate and with labor taxes that can fund transfers.

We consider a representative individual with utility function  $u(c, h)$  increasing in consumption  $c$  and decreasing with hours of work  $h$ . The individual maximizes  $u(c, h)$  subject to a budget constraint  $c = \bar{w}h + R$  where  $\bar{w} = w \cdot (1 - \tau_L)$  is the net-of-labor-tax wage rate and  $R$  is a lump-sum transfer from the government.

This generates an uncompensated (Marshallian) labor supply function  $h^u(\bar{w}, R)$  with  $\varepsilon^u = (\bar{w}/h)\partial h^u/\partial \bar{w}$  the uncompensated labor supply elasticity with respect to the net wage and  $\eta = \bar{w} \cdot \partial h^u/\partial R$  the income effect parameter (marginal propensity to earn out of non-wage income). The Slutsky equation implies that  $\varepsilon^c = \varepsilon^u - \eta$  where  $\varepsilon^c$  is the compensated (Hicksian) elasticity of hours of work with respect to  $\bar{w}$ . The compensated elasticity captures substitution effects.<sup>26</sup> Theoretically,  $\varepsilon^c \geq 0$ ,  $\eta \leq 0$ , and  $\varepsilon^u$  is not signed (but less than  $\varepsilon^c$ ). These parameters are not necessarily constant and can all vary with  $\bar{w}$  and  $R$ .

Absent taxes and transfers, an increase in  $w = \bar{w}$  due to productivity gains over the process of development is a pure uncompensated wage effect. Its impact on hours of work is governed by  $\varepsilon^u$ . Our cross-sectional and time series analyses pointed to an almost zero relationship between hours worked and development, consistent with zero (or at least very small) uncompensated elasticities of labor supply in this context.

With taxes and transfers, let us assume that a fraction  $\lambda$  of labor taxes fund the transfer  $R$  and that the remaining  $1 - \lambda$  funds other programs or public goods that do not affect labor supply. In this case,  $R = \lambda \cdot \tau_L \cdot w \cdot h^u$  and  $h = h^u(w \cdot (1 - \tau_L), \lambda \cdot \tau_L \cdot w \cdot h)$ . The solution of this implicit equation in  $h$  is the reduced form labor supply function denoted by  $h^r(w, 1 - \tau_L)$ . We can define the corresponding reduced form elasticities  $\varepsilon_w = (w/h) \cdot \partial h^r/\partial w$  and  $\varepsilon_{1-\tau_L} = (1 - \tau_L)/h \cdot \partial h^r/\partial(1 - \tau_L)$ . We can express these two reduced form elasticities in terms of the structural elasticities by differentiating the implicit equation defining  $h^r$  with

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<sup>26</sup>Formally,  $\varepsilon^c = (\bar{w}/h)\partial h^c/\partial \bar{w}$  where  $h^c(\bar{w}, u)$  is the Hicksian labor supply  $h^c(\bar{w}, u)$ .  $h^c(\bar{w}, u)$  minimizes the cost  $c - \bar{w}h$  to reach utility level  $u$ , i.e. solves the minimization problem  $\min_{c,h} c - \bar{w}h$  subject to  $u(c, h) = u$ .

respect to  $w$  and  $1 - \tau_L$ . Routine computations show that:

$$\varepsilon_w = \frac{w}{h} \frac{\partial h^r}{\partial w} = \frac{\varepsilon^u + \eta \cdot \lambda \cdot \frac{\tau_L}{1-\tau_L}}{1 - \eta \cdot \lambda \cdot \frac{\tau_L}{1-\tau_L}}. \quad (\text{D1})$$

$$\varepsilon_{1-\tau_L} = \frac{w}{h} \frac{\partial h^r}{\partial(1-\tau_L)} = \frac{\varepsilon^u - \eta \cdot \lambda \cdot \frac{1}{1-\tau_L}}{1 - \eta \cdot \lambda \cdot \frac{\tau_L}{1-\tau_L}}. \quad (\text{D2})$$

Two specific cases are worth emphasizing.

First, when  $\lambda = 0$ , i.e. taxes do not fund transfers, then  $\varepsilon_w = \varepsilon_{1-\tau_L} = \varepsilon^u$ . Both  $w$  and  $1 - \tau_L$  have pure uncompensated effects.

Second, when  $\lambda = 1$  and  $\tau_L = 0$ , i.e. there is no pre-existing tax and any new small tax funds transfers only, then  $\varepsilon_w = \varepsilon^u$  and  $\varepsilon_{1-\tau_L} = \varepsilon^c$ :  $w$  has a pure uncompensated effect and  $1 - \tau_L$  has a pure compensated effect.

In the general case with  $\lambda > 0$  and  $\tau_L > 0$ , the reduced form elasticities are mixtures of income and substitution effects:

$\varepsilon_w$ : An increase in  $w$  is associated with an increase in taxes collected and hence in the lump-sum transfer  $R$  they partly fund. With positive income effects ( $\eta < 0$ ), this further reduces labor supply, making  $\varepsilon_w$  smaller than  $\varepsilon_u$ . In other words, a secular increase in  $w$  can reduce  $h$ .

$\varepsilon_{1-\tau_L}$ : An increase in  $1 - \tau_L$  increases the net wage rate but reduces taxes and hence the transfer  $R$ , which further increases labor supply in the presence of income effects.

Hence, income effects have opposite effects on these two reduced form elasticities.

More precisely, using (D1) and (D2), we can express the structural elasticities  $\varepsilon^u$  and  $\eta$  as a function of the reduced form elasticities as follows:

$$\eta = \frac{1 - \tau_L}{\lambda} \cdot \frac{\varepsilon_w - \varepsilon_{1-\tau_L}}{1 + \tau_L + \tau_L \cdot (\varepsilon_w - \varepsilon_{1-\tau_L})}. \quad (\text{D3})$$

$$\varepsilon^u = \frac{\varepsilon_w + \tau_L \cdot \varepsilon_{1-\tau_L}}{1 + \tau_L + \tau_L \cdot (\varepsilon_w - \varepsilon_{1-\tau_L})}. \quad (\text{D4})$$

Two consequences are worth emphasizing.

First, the income effect parameter is related to the gap  $\varepsilon_w - \varepsilon_{1-\tau_L}$  and is zero if and only if

this gap is zero. Empirically, we have found  $\varepsilon_w \ll \varepsilon_{1-\tau_L}$  which implies sizable income effects in the context of this model.

Second, in the empirically relevant case where  $\varepsilon_w \simeq 0 < \varepsilon_{1-\tau_L}$ , we have  $\varepsilon^u = \tau_L \cdot \varepsilon_{1-\tau_L} / (1 + \tau_L - \tau_L \varepsilon_{1-\tau_L})$ . Hence, even a zero reduced form elasticity  $\varepsilon_w$  is consistent with a positive uncompensated elasticity  $\varepsilon^u$  if the tax rate is not small. Intuitively, an increase in  $w$  translates into an increase in  $R$  which depresses labor supply and can offset the positive uncompensated effect. For example, even with  $\varepsilon_w = 0$ ,  $\tau_L = 0.5$  and  $\varepsilon_{1-\tau_L} = 0.5$  implies  $\varepsilon^u = 0.2$ .