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 taxes are strongly negatively correlated with prime-age hours worked. Controlling for government transfers only partly reduces this link, ruling out substitution and income effects on labor supply as the only driver. Controlling for working hours regulations and the size of the formal sector eliminates it, suggesting that regulations also play a large role in reducing intensive hours in higher-income countries. Together, our findings suggest that collective choices and social norms often encoded in public policy powerfully shape hours worked over and above pure economic development.

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1. Introduction

There is a large literature on the evolution and determinants of hours worked, drawing on labor force surveys that have been carried out in many countries. Yet, to date, no work has been able to 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.

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 new data construction was made possible thanks to several recent developments.

First, in terms of data access, the International Labor Organization (ILO) and the World Bank have been gathering household and labor force surveys across the world and making them as comparable as possible (see Messenger, Lee and McCan 2007 for a description of the ILO data and Montenegro and Hirn 2009 for the World Bank data). Both the ILO and World Bank 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 labor database.[1] The World Bank data can be accessed by its researchers for academic purposes. A number of large developing countries have also started publicly sharing—or even creating—labor force survey data with information on hours worked, notably China and India, which account for 35% of the world population and were not included in Bick, Fuchs-Schündeln, and Lagakos' (2018) seminal study.

Second, in terms of variables for the analysis, a number of recent studies, many as part of the World Inequality Database project, have built country-level and decades-long socioeconomic and public policy variables, particularly on taxes (Bachas et al. 2026) and government spending (Fisher-Post and Gethin 2025, Gethin 2025a). This allows us to explore the links between public

[1] 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.

policy and hours worked in a much broader and comprehensive way than previously done.

Third, in terms of methodology, a key concern emphasized by Bick, Fuchs-Schündeln, and Lagakos (2018) is that surveys carried out in specific periods of the year can create biased estimates of hours worked due for example to seasonal variations in agricultural work. As a result, Bick, Fuchs-Schündeln, and Lagakos (2018) primarily focused on a core database of 49 countries (out of their 80) covering 23% of the world population. Our careful investigation of seasonality using high-quality labor force surveys fielded over the entire year reveals that monthly seasonality in hours worked is limited in developing countries (it is actually larger in richer countries due to summer holidays.). This gives us confidence that surveys that do not cover the full year still provide reliable information on annual hours worked.

Finally, we are publishing here and plan on regularly updating a publicly available database (along with metadata documentation), 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 here 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. In all cases, we follow international conventions and measure weekly hours worked in all jobs that contribute 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 that our surveys cover. 59% of the world's adult population (aged 15+) is employed. They work an average of 42 hours per week. This implies that 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 the extensive employment rate margin.

Second, in terms of cross-country comparisons, we find that hours worked slightly decline with GDP but are 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 manufacturing and services are very high in middle-income countries, while hours in agriculture are moderate in level and flat with GDP per adult. 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 0-20% 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+) fall with development. In simple cross-country regressions, these declines are entirely driven by rising school attendance for the young and public pension coverage for the elderly, in line with a broad body of work. In the time series, the fall of youth work is particularly pronounced while elderly work is stable rather than falling. This is consistent with developing countries increasing schooling faster but implementing elderly pensions more slowly than frontier economies did in the past.

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 rise with development, while male hours decline. There is considerable heterogeneity in this pattern across countries and overtime. Muslim/Hindu religion depresses female hours worked enormously while former communist status increases them. The fall in male hours worked is driven by reduced hours per worker and is quantitatively offset by increases in female employment rates. This suggests that the process of development tends to equalize hours across genders, reducing the long hours of working men while allowing more women to become employed in GDP-generating activities.

Fourth, we explore the link between prime-age hours of work and public policies: taxes on labor, transfers, and hours of work regulations. Consistently with a body of work in richer countries, we find that labor taxes are strongly negatively related to hours worked both in international comparisons and within-country time series. In contrast, GDP per capita is only weakly positively correlated with hours worked once tax variables are controlled for, with an elasticity of around 0.1. As discussed in the macroeconomics literature, a standard labor supply model with a low uncompensated labor supply elasticity but large compensated labor supply 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 controlling for social spending (cash or quasi-cash transfers) attenuates the labor tax effects, consistent with this explanation. However, this attenuation is only partial. In contrast, controlling for the share of formal workers and working hours regulations reduces much more the link between labor taxes and hours. This suggests that labor taxes depress hours worked not mainly through income and substitution effects but rather because they correlate with the development of the formal sector with regulated working hours.

Together, our findings point to the powerful role played by collective choices and public policies in shaping the structure of hours worked. Schooling and pension systems, cultural norms regarding women, and regulations on hours worked have first-order effects on working hours and their allocation by age and gender beyond development. While economic growth may help develop such institutions, many of them are only partially determined by it. This explains 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 overtime, which we briefly describe to place our study in context.

Cross-Country Comparisons. As mentioned previously, Bick, Fuchs-Schündeln, and Lagakos (2018) have built the most comprehensive cross-sectional database on hours worked. Their core database covers 49 countries representing 23% of the world population (with an extended database of 80 countries covering 41%). Their main finding is that hours worked fall 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 in a sample of 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.[2] 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 expand the scope of the analysis to the entire world, as well as to reevaluate the roles of economic, cultural, and institutional factors.

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 work hours in 57 countries and world regions over 1800-2025. The key challenge is that historical data generally exist only for specific occupations rather than providing 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.[3] 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 time series has primarily focused on richer countries and the role of income and substitution effects on hours worked (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 and their determinants in 86 countries at all development levels.

Our paper is organized as follows. We discuss the construction of the data in Section 2. We analyze global hours worked in Section 3. We provide cross-country comparisons in Section 4. We turn to time series evidence in Section 5. We analyze the role of taxes, social spending, and regulations in Section 6. Section 7 concludes.

[2] 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, 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.

[3] Ngai, Olivetti, and Petrongolo (2024) provide even longer time series for the U.S. but no age breakdown, which is why we use Ramey and Francis (2009) series in our comparison of historical US with contemporary data.

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 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 globally. 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.[4] 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

[4]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 of these surveys contain a detailed labor module, which allows us to observe employment and hours worked.

3) Global Monitoring Database. The 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. Its objective is to compile and harmonize 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. It brings together almost 1,000 surveys fielded in 31 European Union countries, some of which go back to the 1980s. While the EU-LFS are 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.

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 download and harmonize 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 hours worked 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 implies that own consumption work (such as subsistence agriculture) is not counted as employment in a number of 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 do 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, Philippines, and Pakistan) for the various sources, as well as the series that we have selected from those sources. Appendix Figure C2 compares our estimates of hours worked with those available in the Penn World Tables. They correlate positively, although there are many countries for which the two measures differ substantially.[5]

[5]PWT sources 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 work hours, we collect information on a number of 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 (Tchad, 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 in countries in the Middle East and North Africa, where surveys covering work 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 over 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, but several countries still 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 work 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 LIS data 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 the surveys in our database varies substantially. Some surveys were run over a couple of months in the year, while others were deliberately fielded over the whole year to account for seasonal fluctuations. Fortunately, the exact quarter of interview is available in a large number of these high-quality surveys, allowing us to directly investigate seasonality and the degree to which it could 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 smaller 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.[6]

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%.[7]

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)). This provides 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

[6] Appendix Figure C5 shows that hours by the young 15-19 increase in the third quarter in Western and Eastern Europe but display limited seasonality in developing countries.

[7] Let us stress that these findings do not rule out the possibility of significant seasonality across weeks within a given month or quarter (see, e.g., Frazis and Steward 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 on jobs contributing to GDP. Men work 31.7 hours and women 17.4 hours on average. Hence, women's hours worked are only 55% of men's hours worked: they provide 35% of global hours worked while men provide 65%. Most of this gender gap is explained by the extensive employment margin as 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 over. 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, that we define 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), employment rates per adult in panel (b), weekly hours worked per worker in panel (c) by gender and 5-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 (age 30-49) work, while less than 30% of young (age 15-19) and elderly (age 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 work 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 of work among workers. It shows that there are spikes in hours of work, generally corresponding to social norms or regulations about normal hours per day and 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 below.

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. Industrial disaggregation analyzed in Section 4.2 helps understand the evolution of hours per worker. Age and gender disaggregations, analyzed in Sections 4.3 and 4.4, help understand the evolution of employment rates. To be representative of the full world population as in Section 3, we consider population-weighted estimates in our benchmark estimates. In Section 4.5, we explore the sensitivity 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 of work per adult (aged 15+) in panel (a) with a decomposition of the employment rate across countries in panel (b) and hours per worker in panel (c). We depict each country as a single circle whose area is proportional to adult population size. We also use colors for world regions (as in Appendix Figure A1) and we report the names of the largest countries (adult population above 50 million). This representation illustrates well the heavy weight of India and China, about 35% of the world population, in global hours worked. In all figures, we depict the best quadratic fit (weighted by adult population), which is useful to uncover non-monotonic patterns across countries.

Panel (a) shows that hours per adult are very weakly correlated with GDP per adult.[8] If anything, they are slightly bell-shaped. 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 and insignificant.

Panel (b) shows overall stability of the employment rate with development and panel (c) shows a bell shape of hours per worker, with a clear and marked decline for higher income countries. As a simple illustration, while employment rates are similar in China and Germany, hours of work per adult are 50% higher in China than in Germany. The heterogeneity conditional on GDP per adult is more pronounced in employment rates than in hours per worker, and is driven by strong 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 log GDP per adult in 2023 PPP USD. Panel (a) shows a clear decline in the standard deviation

[8] Appendix Figure A2 shows an almost identical pattern when using GDP per worker or GDP per hour instead of GDP per adult.

of working hours with 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. This suggests that there is more uniformity in hours of work at higher levels of development and that very long hours, such as 60 hours or more, become very uncommon in higher income countries. For example, in rich countries such as the U.S., France, and Germany, only about 10 percent of workers work in excess of 50 hours while in most poor countries at least 10 percent of workers work in excess of 60 hours. This growing uniformity and disappearance of long hours is consistent with the rise of formal employment and working hours regulations, which relates strongly to the decline in hours with development as we show in Section 6.[9]

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 broad industrial category. Figure 4 depicts average weekly hours of work per worker by industry against log GDP per adult in 2023 PPP USD. We divide workers into four broad industrial 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. In contrast, the three other industrial groups show a bell shape 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 is consistent with the very high hours of work in the early stages of industrialization in the late 19th and early 20th centuries, which then came down as regulations

[9] Appendix Figure A3 shows that variations in hours of work 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- and lower-middle income countries. The opposite is true in some countries, however, such as China, Russia, and Italy.

on overtime work were introduced (see Gilmore 2021 and Andreescu et al. 2025). Hours of work in government/education/health services are generally somewhat lower than market services in most countries, as governments typically set lower working hour standards for government workers relative to private sector workers.

Therefore, the bell shape of hours of work per worker with GDP per adult can be understood as follows. Hours of work per worker are around 40 in very poor countries, where agriculture dominates with typical hours around 40 per week (see Appendix Figure A4 for the fraction of workers in each sector across countries). With development, the share of workers in manufacturing and private services grows and these sectors tend to have substantially longer hours than agricultural work. This creates the rising pattern at low levels of development. At higher levels of development, hours of work in manufacturing and private services decline and the share of government/education/health service workers, who tend to have lower hours, further grows. We show that the decline correlates strongly with the development of the social state, taxes, spending, and especially formal employment and working hours regulations in Section 6. This creates the declining pattern at higher levels of development.[10]

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 (age 20-59) in panel (a), for the young (age 15-19) in panel (b), and for the elderly (age 60+) in panel (c) against log GDP per adult. The decomposition into employment rates and hours per worker is provided in Appendix Figures A5, A6, and A7.

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,

[10] This pattern is also consistent with Bick et al.'s (2022) model of structural change in labor supply along the development spectrum, with a self-employment sector with low fixed costs (agriculture) and a modern wage-employment sector with high initial fixed costs (and hence long hours) that fall overtime as the modern sector absorbs most workers. Appendix Figure A3(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.

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 of work per prime-age adult and log GDP per adult (column 4).

Panel (b) shows a notable decline of hours of work of the young (age 15-19) with development. Panel (c) shows an even stronger decline of hours of work of the elderly (age 60+). Table 2, Panel A columns 2 and 3 show the quantitative magnitudes. We estimate large negative elasticities, 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.[11]

Schooling and Hours of Work of the Young. Educational attainment increases with development, implying that young workers are more likely to attend school in richer countries and hence have less time available for work. Figure 6 panel (a) plots school attendance against hours of work of the young (age 15-19) across countries. There is a strong negative correlation between school attendance and hours of work of 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 determinants 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 main determinant of their hours worked (columns 2-4). Increasing school attendance by 1 percentage point decreases hours of work by 3.9%. This variable alone explains 60% of the variation across countries, which is much larger than the adjusted $R^2 = 23\%$ when

[11] Appendix Figure A8 compares actual hours of the elderly to hours of the elderly when reweighting the data to match the U.S. demographic structure. Controlling for the age structure has only a small impact on elderly hours.

including only GDP. 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 a powerful driver of hours worked by the young, and this relationship is not only driven by the fact that school attendance is more prevalent in richer countries.

Finally, column 4 shows that a higher agricultural employment share increases hours of work of the young (even when all the other variables are included). This is consistent with a broad body of work (see, 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). This suggests that hours of work of the young are not reduced through income effects but rather through substitution with education and shifts in the sectoral structure. This is consistent with a large literature on child labor that emphasizes the role of education in preventing it (see, e.g., Basu 1999 for a survey).

Public Pensions and Hours of Work of 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+).[12] 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 average hours of work of adults aged 60+ on various determinants. Estimates are weighted by adult population size. The

[12] We construct this measure of public pension coverage by combining data from six sources: the World Bank's ASPIRE database for the majority of 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 or Thailand for example. As a result, pension coverage is much lower in China, India, and a number of other 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.

sample includes 92 countries for which the determinants we consider are available. It covers 78% of 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 controlling for the size of the elderly population. Pension spending and coverage together explain over 70% of cross-country variations in elderly hours worked (column 2), while GDP alone explains 42% (column 1). One additional GDP point of 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 workforce in manufacturing is also negatively correlated with elderly hours worked as the manufacturing sector tends to be organized in large unionized firms, which can offer pensions before public pension systems are created. Therefore, while the elderly in richer societies work less, this is not necessarily due to an income effect of economic growth on elderly labor supply but is mediated through the development of pensions in richer societies. 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 a reduction 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 average weekly hours of work 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 A9 and A10.

Hours worked by prime-age men are clearly 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 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 the sectoral evolution by development status.

In panel (b) for women, we group countries in 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 are particularly low in Muslim/Hindu countries. Almost all of the 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 to work rather than development. Women work equally little in the middle-income countries of Egypt and Iran than 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), which is a legacy of communist systems that often required men and women to work the same hours. Other countries (in blue) are generally 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 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 A11, 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 A12 extends this analysis to female-to-male ratios in hours worked, with similar conclusions. Hence, our results differ from the literature because we account for the intensive margin of female hours worked, which offsets the U-shape 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 132 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 has a very strong negative relationship with hours of work. Adding 1 point in the Muslim/Hindu share reduces female hours by 0.6%. Being a former communist country is associated with an increase in working hours of 0.2 log units. In contrast, the fraction of prime-age women living with young children aged 0-5 does not significantly correlate with prime-age female hours of work. 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 strong effects of 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 industrial sector 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. This shows that both social norms and sectoral transitions play a large role in 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 men's hours is driven entirely by the intensive margin (column 6) with no change along the extensive margin (column 7). Conversely, the increase for women 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 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 A13 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, this implies that 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 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. 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, together with its standard error and the adjusted R-squared of the corresponding regression, for various samples and specifications. We compare in each case 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 (80 countries covering 41%), and our full sample (160 countries covering 97%). The corresponding scatter plots of log-GDP per adult versus hours 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). This implies 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) for the most recent cross-sectional surveys available then for those countries. 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 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 consider controlling for the Muslim/Hindu population share and adding region fixed effects. The elasticity becomes slightly more negative when controlling for the Muslim/Hindu share, 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. In contrast, adding dummies for our seven world regions brings the elasticity to zero. Hence, the negative unconditional elasticity is entirely driven by broad regional differences in hours worked, in particular between long hours in Sub-Saharan Africa and East Asia and low hours in Western and Eastern Europe. Within these broad regions, where differences in GDP per adult can still differ by a factor of 10 or more (e.g., Burundi vs. South Africa, Cambodia vs. Japan, Haiti vs. Uruguay, or Yemen vs. Egypt), there is no significant relationship between hours and development.

Finally, we consider the potential 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. Hours worked by prime-age adults are stable with development in virtually all empirical specifications (see Appendix Table A4).

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. This allows 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 the extent of recapitulation in hours worked—that is, whether today's developing countries are retracing the historical path once followed by frontier economies or instead exhibit different dynamics.[13]

5.1. Prime-Age Adults

We start with prime-age adults and then turn to the young and the elderly in the next sub-sections (see Appendix Figure A14 for results on all adults aged 15+). Figure 9 depicts the 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 A15 and A16. For this graphical illustration, we focus on 43 countries grouped into 9 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

[13] 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-section estimates do not. As a result, our cross-sectional analysis picks up additional cross-country differences that are controlled for in our panel regressions.

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 combine 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 industrial sectors, making it truly comparable to the modern microdata labor force surveys we use.

Panel (a) in Figure 9 shows striking stability over decades of hours of work of prime-age adults in 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 A16 shows that the decrease for men comes from the intensive margin while the increase for women comes from the extensive margin. This 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 men's hours is primarily driven by the intensive margin (columns 6 and 7), while the increase for women is driven entirely by the extensive margin (columns 9 and 10).

Appendix Table A5 delves further into this question within the household. The rise in hours of work of women with GDP is stronger among women living with adult men (in most cases married or cohabitating) with much smaller rises for other women and women living alone. This suggests that the rise of women's 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. In other words, the replacement of men's long hours by higher female employment is happening faster (relative to real GDP per adult) in contemporary developing countries than it did historically in frontier economies.[14] 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

[14]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 A10a).

toward gender equality in the labor market.[15]

5.3. Young

Figure 10, panel (a) depicts the evolution by decade of average weekly hours of work among the young (age 15-19), focusing again on the regions and countries for which we have long time series available. The decomposition into employment rates and hours per worker is provided in Appendix Figure A17. 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.

Column 2 of Table 2, Panel B confirms the sharp drop of hours of work of the young, with an elasticity almost 3 times as large as in the cross section in Panel A. Hence, hours worked by the young are converging down faster within countries than would be expected just based on economic growth. This decline reflects the fact that the development of schooling has been proceeding faster in developing countries than it did in the frontier economies of the past, perhaps as international organizations such as the World Bank have promoted education as a key ingredient for development (see e.g., Jones 2007).[16]

5.4. Elderly

Figure 10, panel (b) turns to the evolution of hours worked among the elderly. The decomposition into employment rates and hours per worker is provided in Appendix Figure A18. In contrast to the young, there has been a general stability in elderly hours over time in recent decades (except for the U.S. long time series, which displays a steep decline over 1900-1960s).

Table 2, Panel B, column 3 confirms that hours worked by the elderly are not falling with

[15] Juhn and Murphy (1997) and Blank and Gelbach (2006) provide empirical evidence on crowd-out in the United States. The macroeconomic literature has also 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 while Fukui, Nakamura, and Steinsson (2023) find modest crowd-out at business cycle frequency in the United States.

[16] As illustrative evidence, Appendix Figure A19 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.

log GDP per adult in the panel analysis, while they are falling sharply with log GDP in the cross section in panel A. Hence, developing countries today are not following the path previously taken by richer countries in the middle of the 20th century, which experienced large drops in elderly hours worked (mostly preceding our data and consistent with the U.S. long time series depicted; see for instance Blundell, French, and Tetlow 2017). It is likely that developing countries today are not adopting the very generous public pensions that many richer countries developed in the past. As in the case of schooling, it is 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 in developing countries could have led policymakers to be more cautious in promoting generous public 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 these elasticities, together with the share of time series variation in hours worked explained by GDP per adult (the within R-squared). All estimates include country fixed effects. In our full panel database, we estimate an elasticity around -0.02 to -0.01, substantially smaller in absolute value than in the cross section. The within R-squared is below 1%.

As a complementary statistics 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).[17] 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 in large part 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 Table A4 extends this analysis to prime-age adults. We estimate small positive elasticities (except for Western European countries).

In summary, our panel data analysis reveals that hours worked by the young have declined faster with development than in the cross-section, while elderly hours have remained stable and prime-age hours have increased. 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 recapitulation—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.

[17] We categorize countries into these four groups using the World Bank's country classification by income level.

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 analyzing 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 that affect the labor market. As a caveat, our analysis is correlational and does not necessarily imply causality.

Considerable attention has been put in 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 fairly modest differences in hours worked. In the standard labor supply model, this 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 the enormous micro-level labor supply 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 programs and transfers that benefit individuals. As a result, 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 point has been made 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 on labor supply, 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 the reduced form elasticities of labor supply with respect to the wage rate (proxied by GDP per adult) and with respect to $1 - \tau_L$ (one minus the tax rate on labor income) are related to the uncompensated and compensated structural elasticities when labor taxes (partly) fund transfers. If taxes are fully rebated as transfers and we start from no labor taxes, then the reduced form elasticity of labor supply with respect to the wage rate is exactly the structural uncompensated elasticity and the reduced form elasticity of labor supply with respect to $1 - \tau_L$ is exactly the structural compensated elasticity. If taxes are only partially rebated as transfers or there are pre-existing taxes, the reduced form elasticities are mixtures of the structural elasticity but 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) create macro-level average tax rates on labor income τ_L that are fully consistent with national accounts by combining historical labor income tax revenue series with estimates of labor income shares in each country.[18] Therefore, the tax rates we use reflect actual nationwide average tax rates on labor income and automatically factor in tax evasion and tax avoidance, common in the large informal sectors of less developed countries.

6.1. The Role of Labor Taxes

Let us start with some simple graphical illustrative analysis. Combining Bachas et al. (2026) tax data with our country-level 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. Countries with high labor tax rates tend to have lower unconditional hours of work. The negative relationship for Western Europe and the Anglosphere (depicted in blue) was known from the previous studies we mentioned focusing on OECD countries. What is striking is that the relationship continues to hold when including less developed countries, which tend to have both lower labor taxes and higher hours per adult for men: India and China prolong the negative relationship remarkably well. The quantitative correlation is large with

[18] Bachas et al. (2026) also produce series of average consumption tax rates and average capital income tax rates. We have experimented including these taxes as well in our analysis. In contrast to labor taxes, they are at best weakly related to hours of work and the coefficients have wide standard errors, perhaps because the variation in those taxes across countries is much less than for labor taxes. Furthermore, adding these other taxes does not affect the coefficients on labor taxes. Hence, for simplicity, we focus solely on labor taxes in the following analysis.

hours dropping from 40-45 hours in countries with almost no taxes on labor income down to 25-30 hours in countries with large labor taxes. There is substantial heterogeneity in male hours for countries with low labor tax rates, however.

A regression analysis allows us to do a more systematic correlational analysis while controlling for log GDP per adult and Muslim/Hindu population shares. Table 7, panel A reports results of cross-country regressions of various measures of hours worked on labor tax rates. We regress the log of hours worked on the log of net-of-labor tax rates $\log(1 - \tau_L)$, so that estimates can all be interpreted as elasticities of hours worked with respect to net-of-tax rates. Estimates are weighted by adult population size in each country. The sample covers 126 countries for which 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 0.8. This elasticity is driven primarily by the intensive margin (the coefficient is 0.7 for hours per worker and 0.2 for employment rates). The elasticities for both prime-age men and prime-age women are large (0.7 and 1).[19]

In contrast, the coefficient on log GDP per adult is much smaller, typically 0.1 or less. 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 has to run through the transfers such taxes fund or through a correlation with the development of additional labor reducing policies such as working hours regulations. We explore these two channels next.

6.2. The Role of Transfers

Using data on government transfers, it is possible to directly test whether the high labor tax elasticities are driven by income effects created by transfers funded by labor taxes (e.g., Rogerson

[19]Appendix Table A6 reports similar results for the truly unconditional elasticity of hours with respect to $(1 - \tau_L)$, that is, before controlling for GDP and the Muslim/Hindu population share. The elasticity is generally positive but smaller, except for women for which it is negative due to the confounding role played by Muslim/Hindu countries, which have both low taxes and low female hours. Appendix Table A7 considers panel analysis 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.

2006, 2007; Rogerson and Wallenius 2009). We draw on the database recently compiled by Fisher-Post and Gethin (2025) and Gethin (2025a), who construct new series on the level and composition of government expenditure for most countries in the world since 1980. We focus on social spending expressed as a fraction of GDP, which is defined as all cash and quasi-cash transfers to individuals and is the key component that can reduce labor supply through traditional income effects. We exclude public pensions from social spending because public pensions target the elderly, not the prime-age group we are focusing on in this section. Appendix Table A8 reports similar overall results when controlling for pension spending for the smaller sample of countries for which this variable is available.

In Table 7, panel B, we add social spending as a share of GDP in the tax regression.[20] The elasticities with respect to net-of-labor taxes become smaller, falling by about half across the board to around 0.3-0.6, but generally remain significant. The social assistance variable is significantly negative. This 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 public goods or education). Quantitatively, adding 1 point of GDP to social spending is associated with a reduction in hours of work of about 2-3%. This is consistent with a large income effect channel that we discussed above.

It is worth noting, however, that the labor tax elasticities in Panel B remain substantially above the log GDP per adult elasticities. Therefore, our tentative conclusion based on this analysis is that transfers and income effects can partly but not fully explain why labor taxes are so strongly negatively related to hours of work. Conceivably, labor taxes proxy for social state development, which includes not only economic transfers but also labor regulations (overtime pay, paid vacation, etc.) that can also affect hours of work and to which we now turn.

[20] At the micro-level, there is an obvious endogeneity between hours of work and transfer receipt as many transfers are means-tested and hence larger for those with low hours of work. 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.

6.3. The Role of Regulations

The development of the social state and the large labor taxes that fund them is correlated with the development of working hours regulations that can also potentially play a role in reducing hours of work. Countries often set regulations about normal work hours (e.g., 40 hours in the United States), premium for overtime work (50% in the U.S.), night work, or work on holidays and week-ends. As we saw earlier in Figure 1d, there are very large spikes in the density of weekly hours 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. Drawing on this database, 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 only to the extent that the formal sector is large. For this reason, we combine two variables in our regression analysis: the regulations index and the fraction of formal workers in the economy.[21] Table 7, Panel C presents the results. Two results stand out.

First, formal employment and the regulations index are both negatively correlated with hours of work. These coefficients are generally strongly significant and large in magnitude. For example, moving from a fully informal to a fully formal economy reduces prime-age hours by 0.44 log units (about 55%). Going from no regulations to the strictest regulations (as in France) reduces prime-age hours by 0.23 log units (about 25%). These results are consistent with studies in the OECD context showing that regulations are associated with lower working hours (Causa 2008; Batut, Garnero, and Tondini 2023).

Second, adding these two variables dramatically reduces the labor tax elasticity. The coefficient for prime-age hours falls from 0.8 to essentially zero. Across all columns, the elasticity becomes small and generally insignificant, except for hours per worker. All in all, these esti-

[21] Appendix Figures A20(a-b) and A21(b-c) plot the formal employment share and the regulation index by country against log GDP per adult and prime-age hours worked, respectively. We also investigated using the self-employment share as a proxy for informality, with similar conclusions.

mates imply a fairly modest elasticity of hours with respect to $1 - \tau_L$ of about 0-0.4, in line with the large micro-level literature on hours and taxes. Comparing with Panel B, regulations and formality reduce the elasticity much more than social spending. This suggests that labor taxes depress hours of work not primarily through income and substitution effects but perhaps even more so because they correlate with the development of formal work and the substantial regulations of working hours that come with it.

Finally, Panel D shows the labor tax elasticity estimates when controlling for both social assistance spending and regulations/formality. The elasticity of hours with respect to $1 - \tau_L$ remains close to zero. All coefficients are insignificant, except for the coefficient on hours per worker (0.3). The coefficients on social assistance, formal employment, and regulations are generally all negative. In terms of overall explanatory power, we are able to explain about 50-60% of cross-country variations in hours worked with all the variables included in panel D. Using a simple Shapley decomposition, we find that formal employment and regulations explain about 15 points of the R-squared, taxes 11 points, and social spending 9 points. Figure 11(b) depicts the absence of cross-country correlation between prime-age male hours and labor taxes once conditioning on formality, regulations, and social assistance expenditure (i.e., residualizing hours on these three variables).

Finally, we investigate heterogeneity by country income group in Appendix Table A9 by estimating elasticities of prime-age hours separately for low- and lower-middle-income countries and upper-middle-income and high-income countries. Before controlling for policy variables, we estimate large elasticities within both groups (0.7-0.9). These elasticities drop to zero after controlling for social spending, formal employment, and regulations. As one would expect, the formalization margin plays a dominant role in reducing hours of work in the poorer group of countries: the formal employment variable has a very large effect and explains 16 points of the R-squared. Social spending is not significantly associated with lower hours of work, consistently with the literature documenting little income effects from social programs in developing countries (Banerjee et al. 2024). In contrast, regulations and social spending are more correlated with prime-age hours in richer countries and account together for over 20 points of the R-squared.

7. Conclusion

This paper gathered a new collection of labor force surveys to build a comprehensive and consistent 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 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 (age 15-19) and the elderly (age 60+) fall with development, in line with the development of schooling and pension systems. Prime-age (20-59) hours worked are bell-shaped for men with national GDP per adult 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 overtime within countries. Controlling for government transfers only partly reduces the link between labor taxes and hours, which suggests that income effects associated with government transfers only partially explain the negative correlation between labor taxes and working hours. Controlling for labor regulations and the size of the formal sector reduces this link more sharply, suggesting that the development of the social state and the large labor taxes that fund it is correlated with the development of labor regulations and that these regulations are possibly the main driver of the reduction in hours worked along the intensive margin. Together, our findings suggest that cultural and social choices often encoded in public policy powerfully shape hours worked over and above pure economic development.

REFERENCES

Alesina, Alberto, Edward Glaeser, and Bruce Sacerdote. 2005. "Work and Leisure in the United States and Europe: Why So Different?" In NBER Macroeconomics Annual, Vol. 20, edited by Jonathan A. Parker and Michael Woodford, 1-64. Chicago: University of Chicago Press.

Almeida, Rita, and Pedro Carneiro. 2012. "Enforcement of Labor Regulation and Informality." *American Economic Journal: Applied Economics* 4(3): 64-89.

Andreescu, Marie, Romaine Loubes, Thomas Piketty, and Anne-Sophie Robilliard. 2025. "Global Labour Hours in Paid and Unpaid Work: Inequality, Productivity and Structural Transformation, 1800-2100", WIL Working Paper.

Bachas, Pierre Jean, Matthew Fisher-Post, Anders Jensen, and Gabriel Zucman. 2026. "Capital Taxation, Development, and Globalization: Evidence from a Macro-Historical Database." *American Economic Journal: Applied Economics.*

Banerjee, A., R. Hanna, B. A. Olken, D. S. Lisker. 2024. "Social Protection in the Developing World." Working Paper.

Basu, Kaushik. 1999. "Child Labor: Cause, Consequence, and Cure, with Remarks on International Labor Standards." *Journal of Economic Literature* 37 (3): 1083-1119.

Batut, Cyprien, Andrea Garnero, and Alessandro Tondini. 2023. "The Employment Effects of Working Time Reductions: Sector-Level Evidence from European Reforms." *Industrial Relations: A Journal of Economy and Society* 62, no. 3: 217-232.

Bick, Alexander, Adam Blandin, and Richard Rogerson. 2022. "Hours and Wages." *Quarterly Journal of Economics* 137(3): 1901-1962.

Bick, Alexander, and Nicola Fuchs-Schündeln. 2018. "Taxation and Hours Worked of Married Couples across Countries: A Macroeconomic Analysis." *Review of Economic Studies* 85(3): 1543-1576.

Bick, Alexander, Bettina Brüggemann, and Nicola Fuchs-Schündeln. 2019. "Hours Worked in Europe and the United States: New Data, New Answers." *Scandinavian Journal of Economics* 121(4): 1381-1416.

Bick, Alexander, Nicola Fuchs-Schündeln, and David Lagakos. 2018. "How Do Hours Worked Vary with Income? Cross-Country Evidence and Implications." *American Economic Review* 108(1): 170-199.

Bick, Alexander, Nicola Fuchs-Schündeln, David Lagakos, and Hitoshi Tsujiyama. 2022. "Structural Change in Hours Worked and Cross-Country Differences in Hours Worked." Journal of Monetary Economics 130: 68-85.

Blank, Rebecca M. and Jonah Gelbach 2006. "Are Less-Educated Women Crowding Less-Educated Men Out of the Labor Market?" in *Black Males Left Behind*, ed. R. B. Mincy, Urban Institute Press, 87-119.

Blundell, Richard, Antoine Bozio, and Guy Laroque. 2013. "Extensive and Intensive Margins of Labour Supply: Work and Working Hours in the US, the UK and France." Fiscal Studies 34, no. 1: 1-29.

Blundell, Richard, Eric French, and Gemma Tetlow. 2017 "Retirement Incentives and Labor Supply", *Handbook of Population Aging* edited by John Piggott and Alan Woodland, Elsevier: North Holland.

Blundell, Richard, and Thomas MaCurdy. 1999. "Labor Supply: A Review of Alternative Approaches." *Handbook of labor economics* 3: 1559-1695.

Boppart, Timo and Per Krusell. 2020. "Labor Supply in the Past, Present, and Future: A Balanced-Growth Perspective." *Journal of Political Economy* 128(1): 118–157.

Botero, Juan C., Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2004. "The Regulation of Labor." *Quarterly Journal of Economics* 119(4): 1339-1382.

Bowden, Sue, and Avner Offer. 1994. "Household Appliances and the Use of Time: The United States and Britain since the 1920s." *Economic History Review*: 725-748.

Breza, Emily and Supreet Kaur. 2025. "Labor Markets in Developing Countries." *Annual Review of Economics* 17.

Bridgman, Benjamin, Georg Duernecker, and Berthold Herrendorf. 2018. "Structural Transformation, Marketization, and Household Production around the World." *Journal of Development Economics* 133(1): 102-126.

Causa, Orsetta. 2008. "Explaining Differences in Hours Worked among OECD Countries: An Empirical Analysis." OECD Economic Department Working Papers 596.

Chancel, Lucas, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman. 2022. *The World Inequality Report 2022*, Cambridge: Harvard University Press.

Charmes, Jacques. 2022. "Variety and change of patterns in the gender balance between unpaid care-work, paid work and free time across the world and over time: A measure of wellbeing?" *Wellbeing, Space and Society* 3(1): 1000-1081.

Chiplunkar, Gaurav, and Tatjana Kleineberg. 2025. "Gender Barriers, Structural Transformation, and Economic Development." World Bank Policy Research Working Paper 11083.

Dinkelman, Taryn, and L. Rachel Ngai. 2022. "Time Use and Gender in Africa in Times of Structural Transformation." *Journal of Economic Perspectives* 36(1): 57-80.

Erosa, Andres, Luisa Fuster, and Gueorgui Kambourov. 2012. "Hours Worked and Government Programs: A Cross-Country Analysis." *Journal of Monetary Economics* 59 (1): 84-107.

Fisher-Post, Matthew and Amory Gethin. 2025. "Government Redistribution and Development: Global Estimates of Tax-and-Transfer Progressivity, 1980-2023", WIL Working Paper.

Frazis, H., J. Stewart. 2004. "What Can Time-Use Data Tell Us about Hours of Work?" *Monthly Labor Review*, December 2004, 1-9.

Frazis, H., J. Stewart. 2009. "Comparing Hours per Job in the CPS and the ATUS" *Time Use and Qualities of Life*, 93(1), 191-195.

Fukui, Masao, Emi Nakamura, and Jon Steinsson. 2023. "Women, Wealth Effects, and Slow Recoveries." *American Economic Journal: Macroeconomics* 15(1): 269-313.

Gethin, Amory. 2025. "Revisiting Global Poverty Reduction: Public Goods and the World Distribution of Income, 1980-2022", WIL PSE Working Paper.

Gethin, Amory. 2025. "Distributional Growth Accounting: Education and the Reduction of Global Poverty, 1980-2019," *Quarterly Journal of Economics*, 140(4), 2571–2618.

Gideon, M., B. Helppie-McFall, J. W. Hsu. 2017. "Heaping at Round Numbers on Financial Questions: The Role of Satisficing." *Surv Res Methods*, 11(2), 189-214.

Giles, John, Xiaoyan Lei, Gewei Wang, Yafeng Wang, Yaohui Zhao. 2023. "One Country, Two Systems: Evidence on Retirement Patterns in China." *Journal of Pension Economics and Finance*, 22(2), 188–210.

Gilmore, Oisin, 2021. "The Working Week in Manufacturing since 1820." Chapter 3 in *How Was Life? Volume II. New Perspectives on Well-Being and Global Inequality since 1820*, OECD: Paris.

Goldin, Claudia. 1990. *Understanding the Gender Gap: An Economic History of American Women.* National Bureau of Economic Research.

Goldin, Claudia. 1995. "The U-Shaped Female Labor Force Function in Economic Development and Economic History", in T.P. Schultz, *Investment in Women's Human Capital and Economic Development*, University of Chicago Press, 61-90.

Goldin, Claudia, Lawrence F. Katz. 2002. "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions", *Journal of Political Economy*, 110(4), 730-770.

Goldin, Claudia. 2024. "Nobel Lecture: An Evolving Economic Force", *American Economic Review* 114(6), 1515-1539.

Gottlieb, C., C. Doss, D. Gollin, M. Poschke. 2024. "The Gender Division of Work Across Countries", AMSE, Tufts and McGill.

Greenwood, J., A. Seshadri, M. Yorukoglu. 2005. "Engines of Liberation." *Review of Economic Studies*, 72(1), 109–133.

Greenwood, J., N. Guner, G. Kocharkov, C. Santos." 2016. *American Economic Journal: Macroeconomics*, 8(1), 1–41.

Gruber, Jonathan, and David A. Wise. eds. 1999. *Social Security and Retirement around the World.* Chicago: University of Chicago Press.

Hindman, Hugh D.. 2014. *The World of Child Labor: An Historical and Regional Survey.* Routledge.

Huberman, Michael. 2004. "Working Hours of the World Unite? New International Evidence of Worktime, 1870-1913." *Journal of Economic History*, 64(4), 1964-2001.

Huberman, Michael, and Chris Minns. 2007. "The Times They Are Not Changing: Days and Hours of Work in Old and New Worlds, 1870-2000." *Explorations in Economic History* 44 (4): 538-67.

Jones, Phillip W.. 2007. *World Bank Financing of Education: Lending, Learning and Development.* New York: Routledge.

Jones, Larry E., Rodolfo E. Manuelli, and Ellen R. McGrattan. 2015. "Why Are Married Women Working So Much?" *Journal of Demographic Economics* 81(1): 75-114.

Juhn, Chinui and Murphy, Kevin M. 1997. "Wage Inequality and Family Labor Supply" *Journal of Labor Economics* 15(1): 72-97.

Knowles, John A. 2013. "Why are Married Men Working So Much? An Aggregate Analysis of Intra-Household Bargaining and Labour Supply" *Review of Economic Studies* 80(1): 1055-1085.

McDaniel, Cara. 2011. "Forces Shaping Hours Worked in the OECD, 1960-2004." *FAmerican Economic Journal: Macroeconomics* 3 (4): 27-52.

McGrattan, Ellen R., and Richard Rogerson. 2004. "Changes in Hours Worked, 1950-2000." *Federal Reserve Bank of Minneapolis Quarterly Review* 28 (1): 14-33.

Messenger, Jon C., Sangheon Lee, and Deirdre McCann. 2007. *Working Time around the World: Trends in Working Hours, Laws, and Policies in a Global Comparative Perspective.* International Labor Office. New York: Routledge.

Montenegro, Claudio and Maximilian Hirn. 2009. "A New Disaggregated Set of Labor Market Indicators Using Standardized Household Surveys from Around the World." Background Paper for the 2009 World Development Report *Reshaping Economic Geography*, The World Bank.

Neef, Teresa, Anne-Sophie Robilliard. 2021. "Half the Sky? The Female Labour Income

Share in a Global Perspective", WIL WP 2021/22

Ngai, L. R., C. Olivetti, B. Petrongolo. 2024. "Gendered Change: 150 Years of Transformation in US Hours", NBER Working Paper No. 32475.

Queisser, Monika. 2000. "Pension Reform and International Organizations: From Conflict to Convergence." *International Social Security Review* 53(2): 31-45.

Ohanian, Lee, Andrea Raffo, and Richard Rogerson. 2008. "Long-Term Changes in Hours Worked and Taxes: Evidence from OECD Countries, 1956-2004." *Journal of Monetary Economics* 55(8): 1353-62.

Pencavel, John. 1986. "Labor Supply of Men: A Survey." *Handbook of Labor Economics* 1: 3-102.

Prescott, Edward. 2004. "Why Do Americans Work So Much More Than Europeans?", *Federal Reserve Bank of Minneapolis Quarterly Review* 28, 2-13.

Ramey, Valerie A. 2009. "Time Spent in Home Production in the Twentieth-Century United States: New Estimates from Old Data." *The Journal of Economic History* 69(1): 1-47.

Ramey, Valerie A., and Neville Francis. 2009. "A Century of Work and Leisure." *American Economic Journal: Macroeconomics* 1(2): 189-224.

Rogerson, Richard. 2006. "Understanding Differences in Hours Worked." *Review of Economic Dynamics* 9(3): 365-409.

Rogerson, Richard. 2007. "Taxation and Market Work: Is Scandinavia an Outlier?." *Economic theory* 32(1): 59-85.

Rogerson, Richard. 2008. "Structural Transformation and the Deterioration of European Labor Market Outcomes." *Journal of Political Economy* 116(2), 235-259.

Rogerson, Richard, and Johanna Wallenius. 2009. "Micro and Macro Elasticities in a Life Cycle Model with Taxes." *Journal of Economic Theory* 144(6): 2277-2292.

Saez, Emmanuel. 2021. "Public Economics and Inequality: Uncovering our Social Nature." *AEA Papers and Proceedings* 111: 1-26.

Vidart, Daniela. 2024. "Human Capital, Female Employment, and Electricity: Evidence from the Early 20th-Century United States." *The Review of Economic Studies*, 91(1), 560–594.

Wallenius, Johanna. 2013. "Social Security and Cross-Country Differences in Hours: A General Equilibrium Analysis." *Journal of Economic Dynamics and Control* 37 (2): 2466-82.

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 and 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 defined as 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

					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
Panel A: Cross Section										
Log GDP Per Adult	-0.04	-0.35***	-0.30***	0.02	-0.06**	-0.06***	-0.00	0.20***	0.01	0.18***
	(0.03)	(0.09)	(0.05)	(0.02)	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(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 R2	0.03	0.23	0.30	0.00	0.12	0.20	-0.00	0.11	-0.01	0.13
Panel B: Panel Data										
Log GDP Per Adult	-0.01	-0.89***	0.07*	0.04***	-0.13***	-0.09***	-0.04***	0.34***	-0.03**	0.37***
	(0.01)	(0.05)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(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 R2	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 linking log-hours of work per adult and log-GDP per adult across countries in panel A and within countries and 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 longer time series spanning more than 20 years. 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-section and the panel analysis, 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, particularly so 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 rise of female hours is entirely driven by the extensive margin (employment rate, column 10). Unweighted regressions are presented in Appendix Table B1 and display similar results.

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

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.36***		0.05	0.29**
	(0.10)		(0.06)	(0.12)
Young School Attendance		-3.89***	-4.13***	-3.98***
		(0.39)	(0.47)	(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 R2	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. Regressions are weighted by adult population size in each country to be representative. The sample includes 149 countries where 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 workers in agriculture (resp. manufacturing) countrywide (including all workers). 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 and display similar results.

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

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-0.37***		0.21	0.15
	(0.08)		(0.13)	(0.13)
Pension Spending		-7.09***	-6.05***	-6.23***
		(2.14)	(2.19)	(2.08)
Elderly Population Share		0.41	-1.21	-0.13
		(0.86)	(1.22)	(1.24)
Pension Coverage		-0.70***	-0.92***	-1.10***
		(0.21)	(0.25)	(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 R2	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. 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 has to be at least equal to 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 workers in agriculture (resp. manufacturing) countrywide. Pension coverage and spending are the main determinant 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 and display overall similar results.

Table 5: Hours Worked by Prime-Age Women

	(1)	(2)	(3)	(4)
Log GDP Per Adult	0.22***		-0.04	0.27***
	(0.07)		(0.06)	(0.10)
Muslim/Hindu Share		-0.61***	-0.63***	-0.75***
		(0.12)	(0.12)	(0.15)
Former Communist Country		0.20***	0.20***	0.21**
		(0.04)	(0.04)	(0.10)
% Women Living with Young Children		-0.30	-0.42	-0.61*
		(0.33)	(0.40)	(0.36)
Employment: Agriculture				1.85***
				(0.53)
Employment: Manufacturing				-0.29
				(1.05)
Mean Hours	22.1	22.1	22.1	22.1
N	132	132	132	132
Adjusted R2	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 on various determinants. Regressions are weighted by adult population size in each country to be representative. The sample covers 132 countries for which all the variables are available. It covers 89% of the world adult population. Fraction living with young children is the fraction of prime-age women living in households with one or more children of age 0-5. A higher Muslim/Hindu population share reduces hours of work while being a former communist country increases hours of work. 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). It becomes negative with the three sociodemographic controls (column 3), and positive again when controlling for the share of total (male+female) employment in agriculture and manufacturing (column 4). Unweighted regressions are presented in Appendix Table B5 and display overall similar results.

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

	Population-Weighted			No Weight		
	Coefficient	SE	R^2	Coefficient	SE	R^2
<u>**A. Cross Section**</u>						
Bick et al. 2018 Core Sample	-0.114**	(0.045)	0.269	-0.143***	(0.029)	0.403
Bick et al. 2018 Full Sample	-0.113***	(0.034)	0.265	-0.119***	(0.021)	0.287
Full Sample	**-0.04**	**(0.027)**	**0.033**	**-0.046*** **	**(0.016)**	**0.050**
Excluding China and India	-0.061***	(0.020)	0.103	-0.046***	(0.016)	0.052
Excluding Small and Oil Countries	-0.039	(0.029)	0.033	-0.067***	(0.017)	0.119
Controlling for Muslim/Hindu Share	-0.08***	(0.023)	0.141	-0.067***	(0.017)	0.110
Controlling for Region Fixed Effects	-0.002	(0.038)	0.593	0.011	(0.030)	0.277
Controlling for Both	-0.007	(0.037)	0.603	-0.014	(0.030)	0.337
Using Fixed Weights by Age-Gender	-0.014	(0.024)	0.005	-0.039**	(0.016)	0.041
<u>**B. Panel Data**</u>						
Full Sample	**-0.012**	**(0.012)**	**0.002**	**-0.022*** **	**(0.007)**	**0.004**
Low/Lower-Middle-Income Countries	0.034**	(0.014)	0.042	0.014	(0.016)	0.003
Upper-Middle/High-Income Countries	-0.031**	(0.015)	0.009	-0.029***	(0.008)	0.007
Muslim/Hindu Countries	0.052***	(0.013)	0.137	0.089***	(0.018)	0.087
Western European Countries	-0.258***	(0.034)	0.339	-0.071***	(0.013)	0.050
Other Countries	-0.054***	(0.018)	0.024	-0.027***	(0.010)	0.005

Notes. This table reports estimates of the elasticity of hours per adult with respect to GDP per adult, its corresponding standard error in parenthesis, and the adjusted R-squared (panel A) or within R-squared (panel B) of the corresponding regression for different samples and specifications. Panel A reports cross-country regressions including 97% of the world population from 160 countries. Panel B reports panel analysis with country fixed effects. It includes 86 countries for which we have longer time series spanning more than 20 years. We report results from both population-weighted (columns 2 to 4) and unweighted (columns 5 to 7) regressions.

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

	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
A. Before Controls						
$\log 1-\tau(L)$	1.15***	0.83***	0.66***	0.16	0.74***	1.010***
	(0.18)	(0.16)	(0.12)	(0.12)	(0.16)	(0.306)
Log GDP Per Adult	0.05	0.08***	0.06**	0.02	0.05*	0.116*
	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.069)
B. Controlling for Social Spending						
$\log 1-\tau(L)$	0.60***	0.42***	0.34***	0.10	0.28**	0.683**
	(0.15)	(0.15)	(0.08)	(0.15)	(0.14)	(0.295)
Social Spending	-0.038***	-0.028***	-0.023***	-0.004	-0.032***	-0.023*
	(0.011)	(0.011)	(0.006)	(0.007)	(0.010)	(0.013)
C. Controlling for Regulations						
$\log 1-\tau(L)$	0.24	0.01	0.40***	-0.32*	-0.01	-0.393
	(0.19)	(0.18)	(0.13)	(0.19)	(0.16)	(0.499)
Formal Employment	-0.52***	-0.44***	-0.06	-0.34**	-0.40***	-0.945**
	(0.15)	(0.14)	(0.09)	(0.13)	(0.14)	(0.407)
Labor Regulations Index	-0.25**	-0.23***	-0.13*	-0.09	-0.22**	-0.291
	(0.10)	(0.09)	(0.07)	(0.06)	(0.09)	(0.188)
D. Controlling for Social Spending and Regulations						
$\log 1-\tau(L)$	0.07	-0.09	0.25*	-0.28	-0.15	-0.360
	(0.20)	(0.19)	(0.13)	(0.19)	(0.16)	(0.475)
Social Spending	-0.025***	-0.016*	-0.022***	0.006	-0.022**	0.005
	(0.009)	(0.008)	(0.005)	(0.006)	(0.008)	(0.015)
Formal Employment	-0.38**	-0.36**	0.06	-0.37***	-0.28**	-0.971**
	(0.15)	(0.14)	(0.08)	(0.14)	(0.13)	(0.445)
Labor Regulations Index	-0.21***	-0.21***	-0.10**	-0.10	-0.19***	-0.298
	(0.07)	(0.07)	(0.04)	(0.06)	(0.06)	(0.192)
N	126	126	126	126	126	126
Adjusted R-Squared	0.65	0.56	0.62	0.54	0.63	0.65

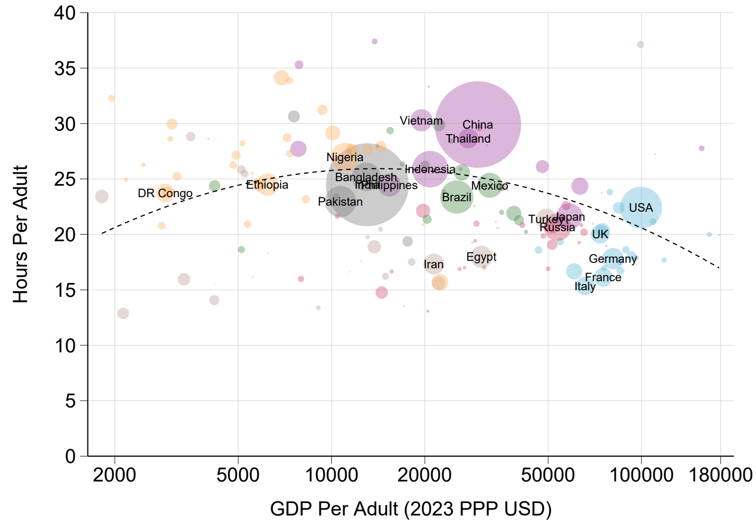
Notes. This table reports elasticities of prime-age hours worked with respect to the net-of-tax rate on labor income $1-\tau_L$ across countries and how those elasticities are affected when adding controls for social assistance spending relative to GDP in Panel B, controls for labor regulations and the share of formal workers in Panel C, and both sets of controls in Panel D. Social spending is measured in GDP points so that the coefficient captures the effect of 1 extra GDP point on log-hours. In all regressions, we also include log GDP per adult and the Muslim/Hindu population share. The sample in all panels covers 126 countries (92% of the world adult population) for which all the tax, social spending, regulations, and formality variables are available. Social assistance spending includes all cash and quasi-cash transfers to individuals but excludes public pensions as we focus on prime-age adults (age 20-59). The labor regulations 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. Adding social spending reduces the elasticity of hours with respect to the net-of-labor-tax rate showing that traditional income effects partly explain the large elasticities in Panel A. Adding working time regulations and the formal share of employment reduces even more sharply the elasticity. Working time regulations and formality both reduce hours of work. Combining both sets of controls, the elasticity of hours with respect to the net-of-labor-tax rate become small and insignificant. Unweighted regressions are presented in Appendix Table B7 and display overall similar results.

Figure 1: Global Hours Worked by Age and Gender

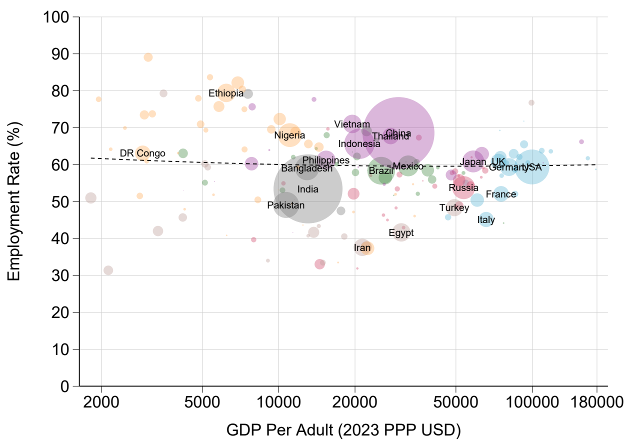
Notes: The figure depicts global average weekly hours of work per adult (aged 15 and above) in panel (a), employment rates per adult in panel (b), and weekly hours of work per worker in panel (c) by gender and 5-year age groups 15-19, 20-24, ..., 60-64, and grouping together those aged 65+. Panel (d) depicts the world distribution of 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 contribute to GDP (non-market home produced services such as cleaning, cooking, and childcare are excluded). The employment rate is defined as 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 is driven primarily by employment rates. Panel (d) show that there are spikes in hours of work, corresponding to social norms or regulations about normal hours per day and number of days off each week. About 11.5% of the world employed population work 40 hours per week, while almost 2% of the employed did not work in the past week due to holidays, sickness, or other reasons.

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

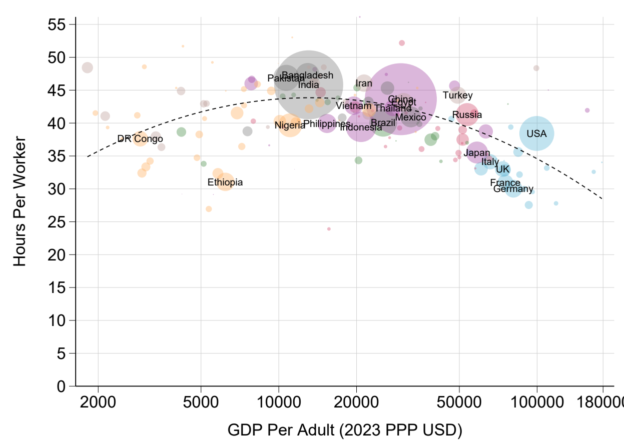
(a) Weekly Hours per Adult



(b) Employment Rate



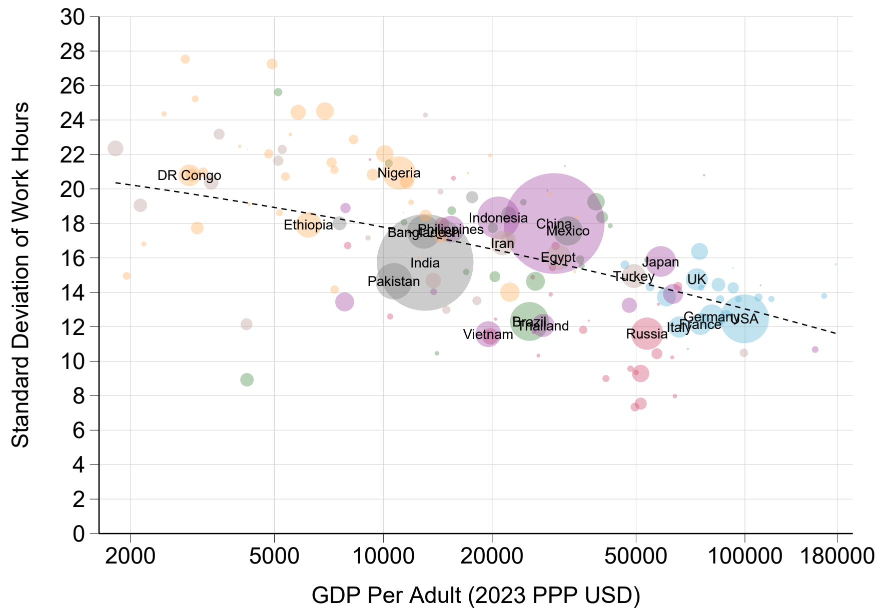
(c) Weekly Hours per Worker



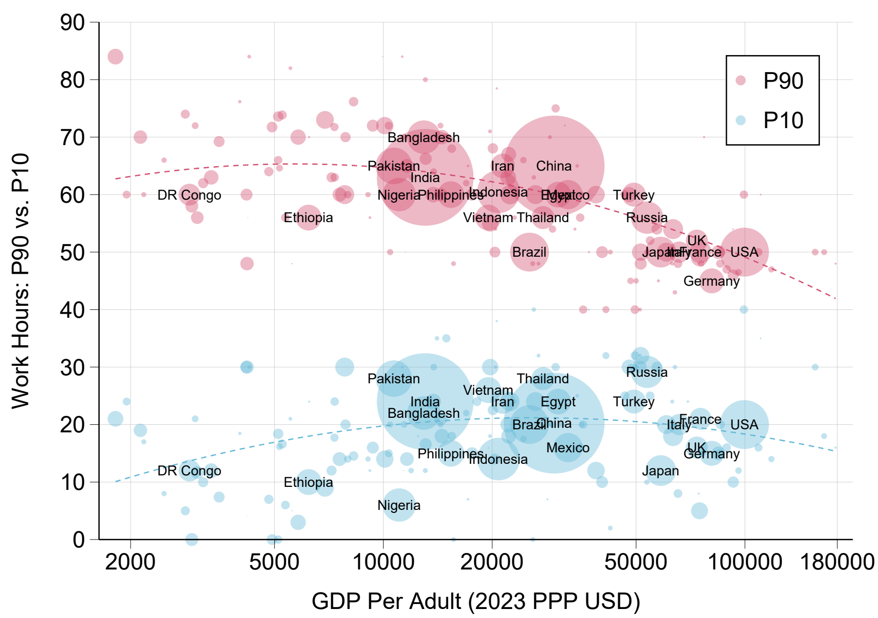
Notes: The figure depicts average weekly hours of work per adult (aged 15+) in panel (a), employment rates per adult in panel (b), and weekly hours of work per worker in panel (c) against log GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Each 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 mild bell shape but weak correlation of hours of work per adult with development overall. Panel (b) shows overall stability of the employment rate with development and panel (c) shows a bell shape of hours per worker, with a substantial decline for higher income countries.

Figure 3: Variance in Hours of Work per Worker within Countries

(a) Standard Deviation in Weekly Hours per Worker

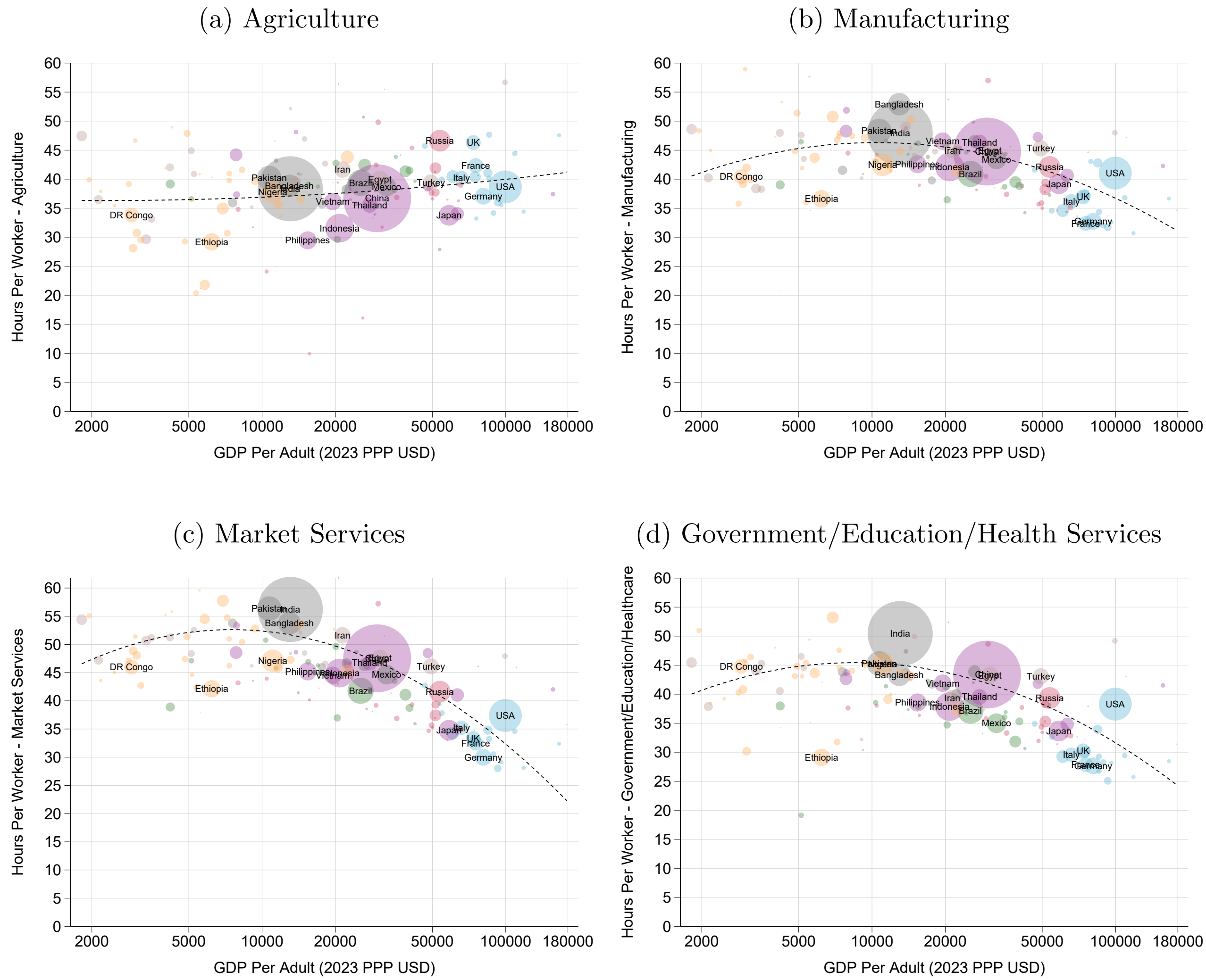


(b) 10th and 90th Percentiles of Hours per Worker



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). Each country's circle's area 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.

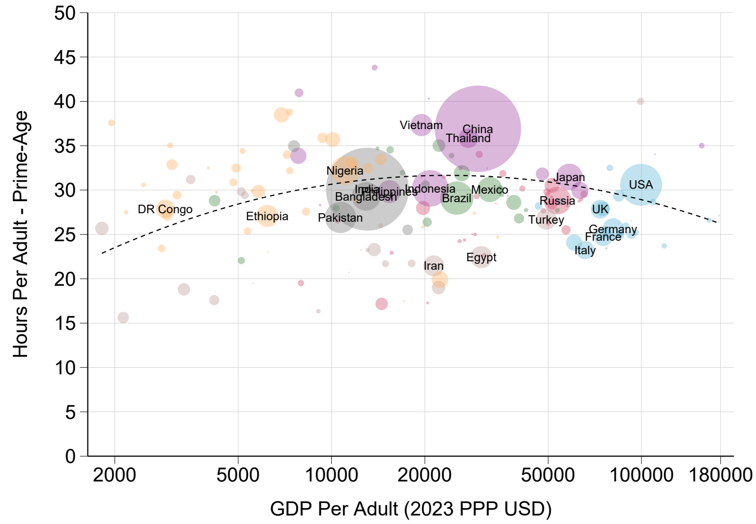
Figure 4: Hours of Work per Worker by Country and Industry



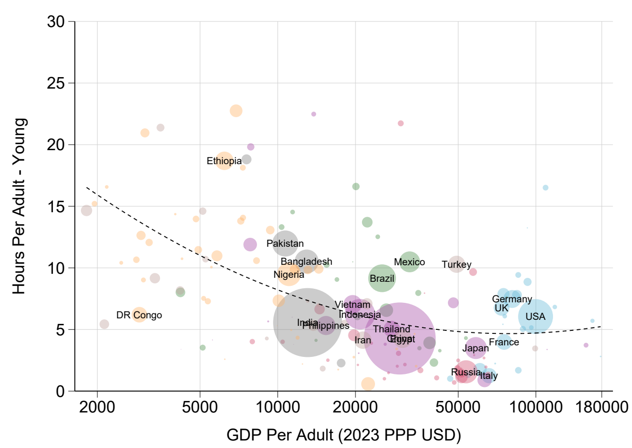
Notes: The figure depicts average weekly hours of work per worker by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Each country's circle's 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 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 for middle-income countries and in market services and manufacturing.

Figure 5: Hours of Work per Adult by Country and Age Groups

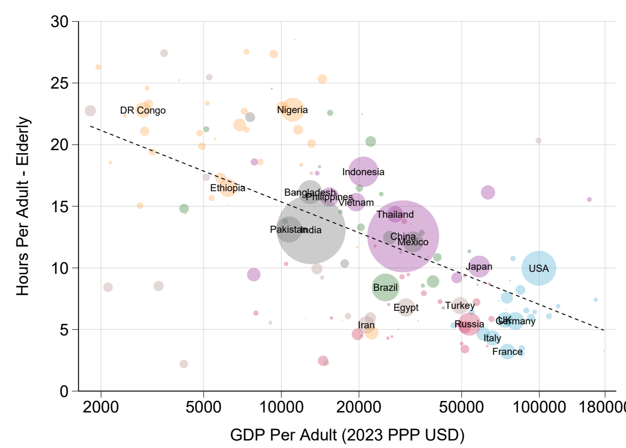
(a) Prime-Age Adults (Aged 20-59)



(b) Young (Aged 15-19)



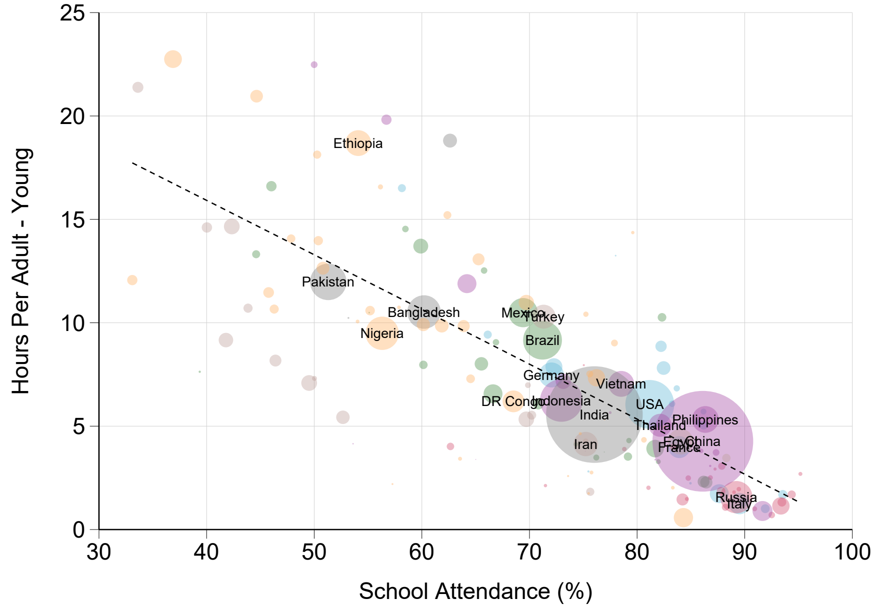
(c) Elderly (Aged 60+)



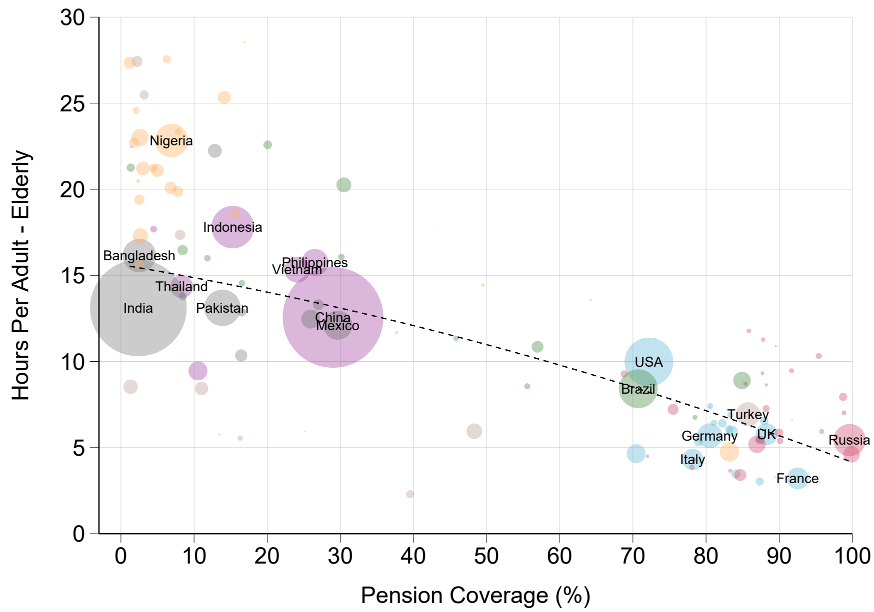
Notes: The figure depicts average weekly hours of work per adult for prime-age adults (aged 20-59) in panel (a), for the young (aged 15-19) in panel (b), and for the elderly (aged 60+) in panel (c) by country ranked by GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). 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 relative stability of prime-age hours of work with development. Panel (b) shows a moderate decline of hours of work of the young with development. Panel (c) shows a strong decline of hours of work of the elderly with development.

Figure 6: Schools and Pensions and Hours Worked by the Young and Elderly

(a) School Attendance and Hours of Work of the Young (15-19)



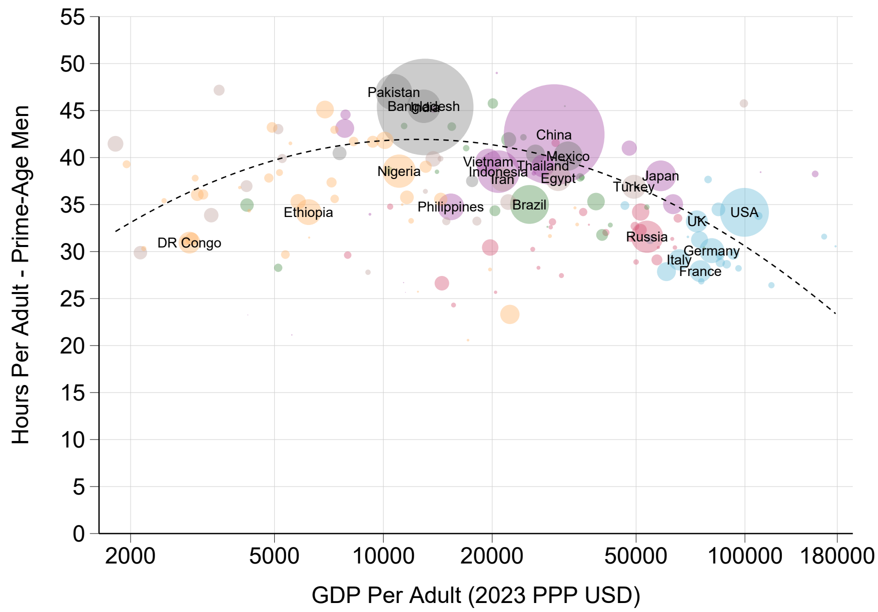
(b) Pension Coverage and Hours of Work of the Elderly (60+)



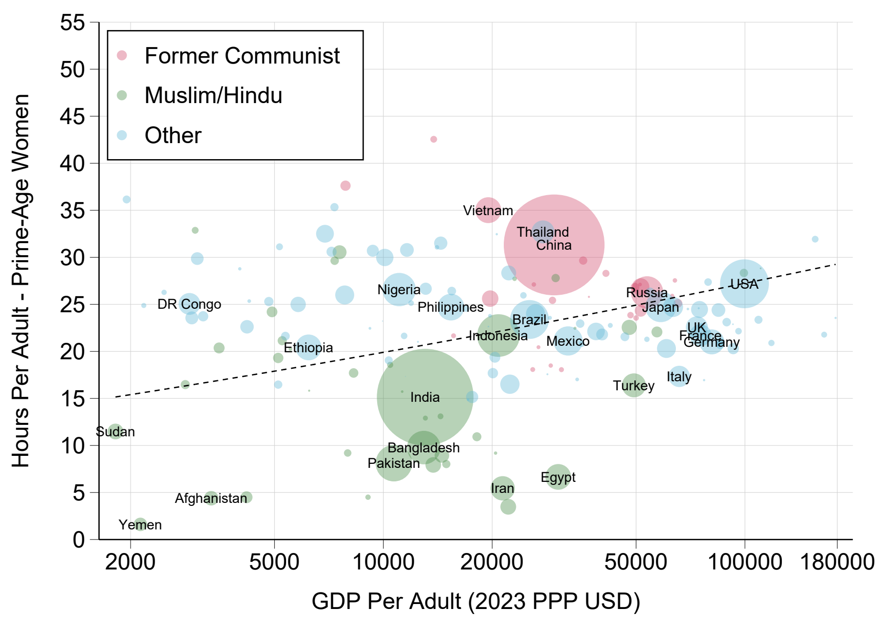
Notes: Panel (a) depicts the correlation between school attendance and hours of work among the young (age 15-19). Panel (b) depicts the correlation between public pension coverage and hours of work among the elderly (age 60+). Pension coverage is defined as the fraction of the elderly living in a household where at least one person is receiving a public pension (of 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 of Work per Adult by Country: Prime-Age Men and Women

(a) Men (Aged 20-59)



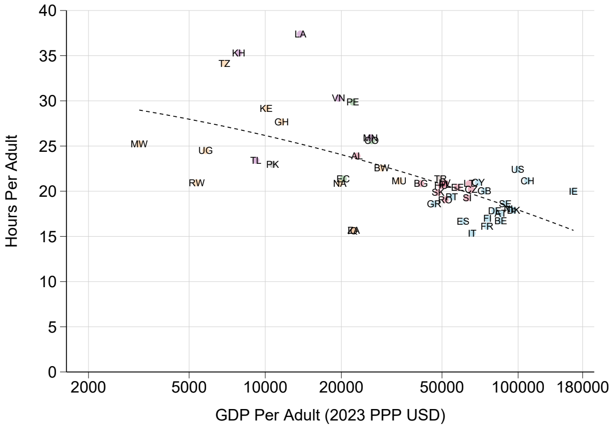
(b) Women (Aged 20-59)



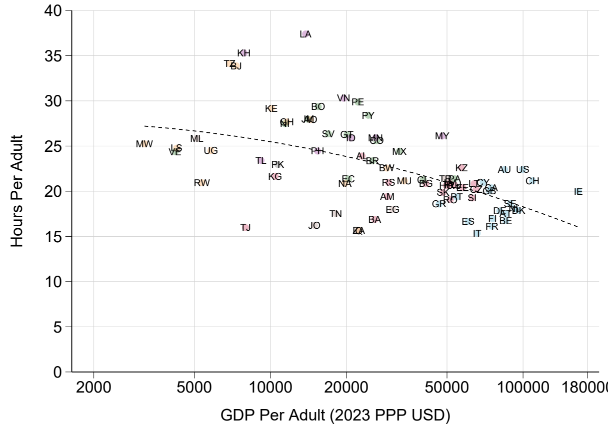
Notes: The figure depicts average weekly hours of work per adult for prime-age men in panel (a), and prime-age women in panel (b), against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table C1). Each country's circle's area 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 in 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 inverted U-shape of male prime-age hours of work with development. Panel (b) shows a strong increase of 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 A11(a)).

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

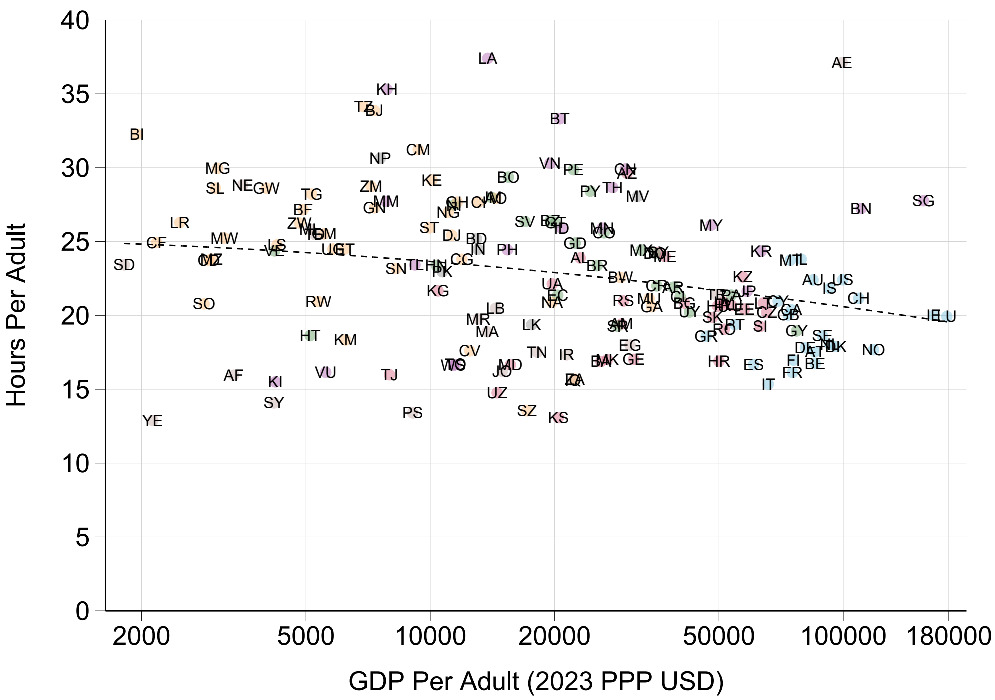
(a) Bick et al. (2018) Core Countries



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



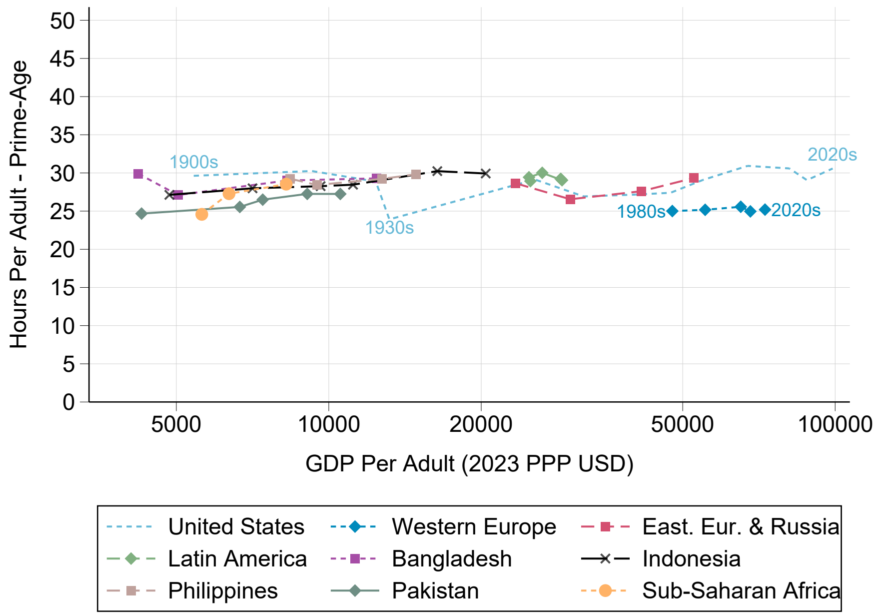
(c) Our Sample



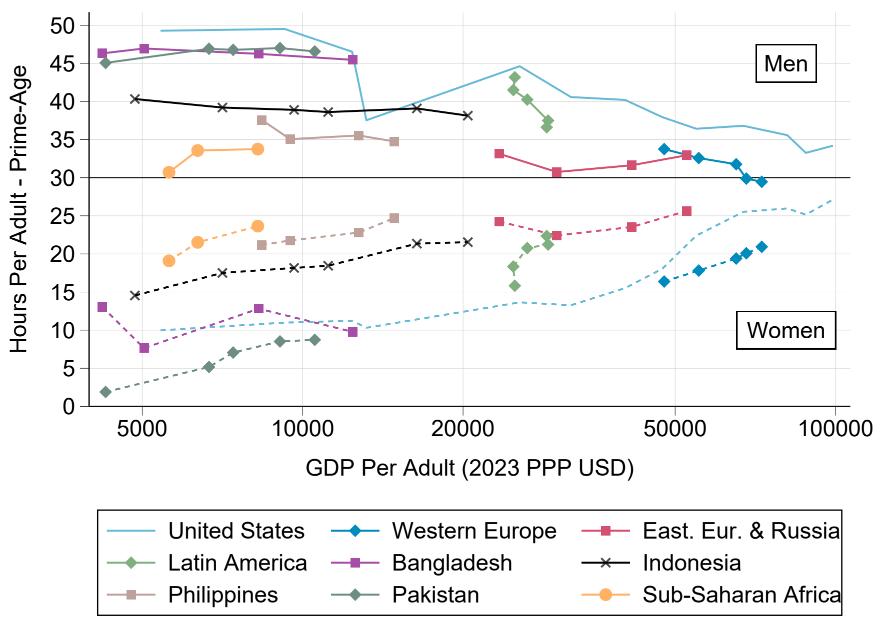
Notes: The figure compares weekly hours per adult over the course of development in the sample of countries studied by Bick, Fuchs-Schündeln, and Lagakos (2018) with our database on global hours worked. Panel (a) plots hours per adult versus GDP per adult in our database when restricting the analysis to the 49 core countries studied in Bick, Fuchs-Schündeln, and Lagakos (2018). Panel (b) does the same for the 80 countries covered in their full database. Panel (c) extends the analysis to all 160 countries in our data. 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 of Work: Prime-Age Adults

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



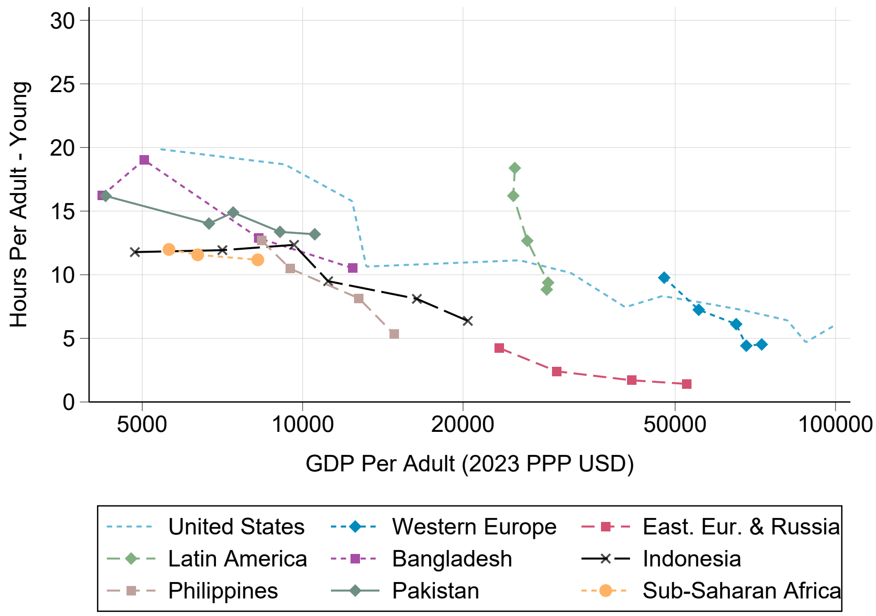
(b) Men vs. Women (Aged 20-59)



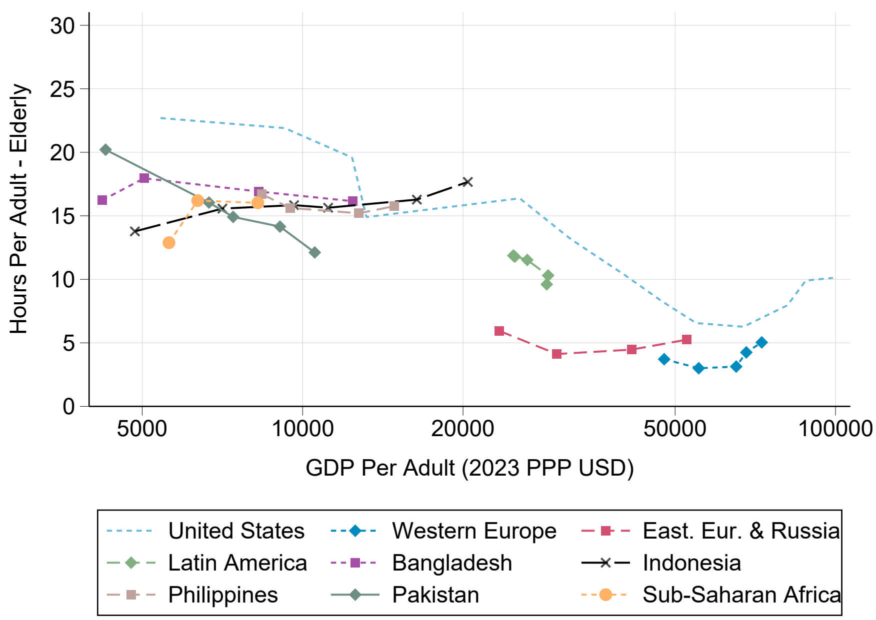
Notes: The figure depicts the evolution by decade of average weekly hours of work per person for prime-age adults (age 20-59) in panel (a), and separately for prime-age men and prime-age women in panel (b) for regions and countries for which we have long time series available. Hours are plotted against 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 times series for the United States combines Current Population Survey data since 1962 along with Ramey and Francis (2009) data for 1900-1959. Panel (a) shows striking stability of prime-age hours of work overtime 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 A16 shows that the male drop is driven by the intensive margin while the female increase is driven by the extensive margin.

Figure 10: Evolution of Hours of Work: Young and Elderly

(a) Young (age 15-19)



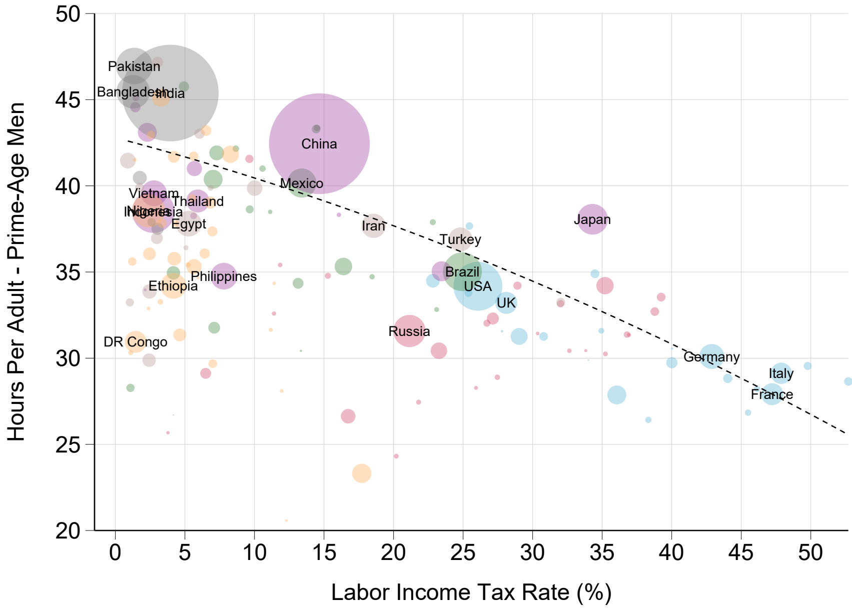
(b) Elderly (age 60+)



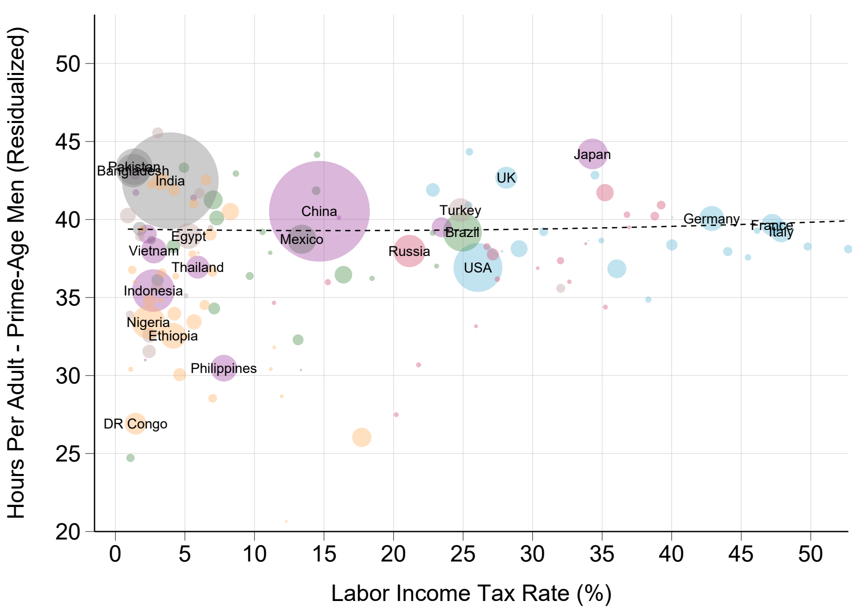
Notes: The figure depicts the evolution by decade of average weekly hours of work per adult for the young (age 15-19) in panel (a), and for the elderly (age 60+) in panel (b) for regions and countries for which we have long time series available. Hours are plotted against country or region GDP per adult 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 times series for the United States combines Current Population Survey data since 1962 along 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 and steep decline in 1900-1960s).

Figure 11: Labor Taxes and Hours of Work of Prime-Age Men

(a) Unconditional



(b) Conditional on Social Assistance, Formal Employment, 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 formal employment, regulations, and social assistance spending in panel (b). In each panel, we use the most recent labor force survey available (generally 2022 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. In panel (b), prime-age male hours are residualized by regressing them on the formal employment share, the regulations index, and social assistance expenditure, predicting 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 assistance transfers relative to GDP (excluding pensions), the share of formal employment, and the labor regulation index.

SUPPLEMENTARY ONLINE APPENDIX

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Appendix A. Additional Main Figures and Tables

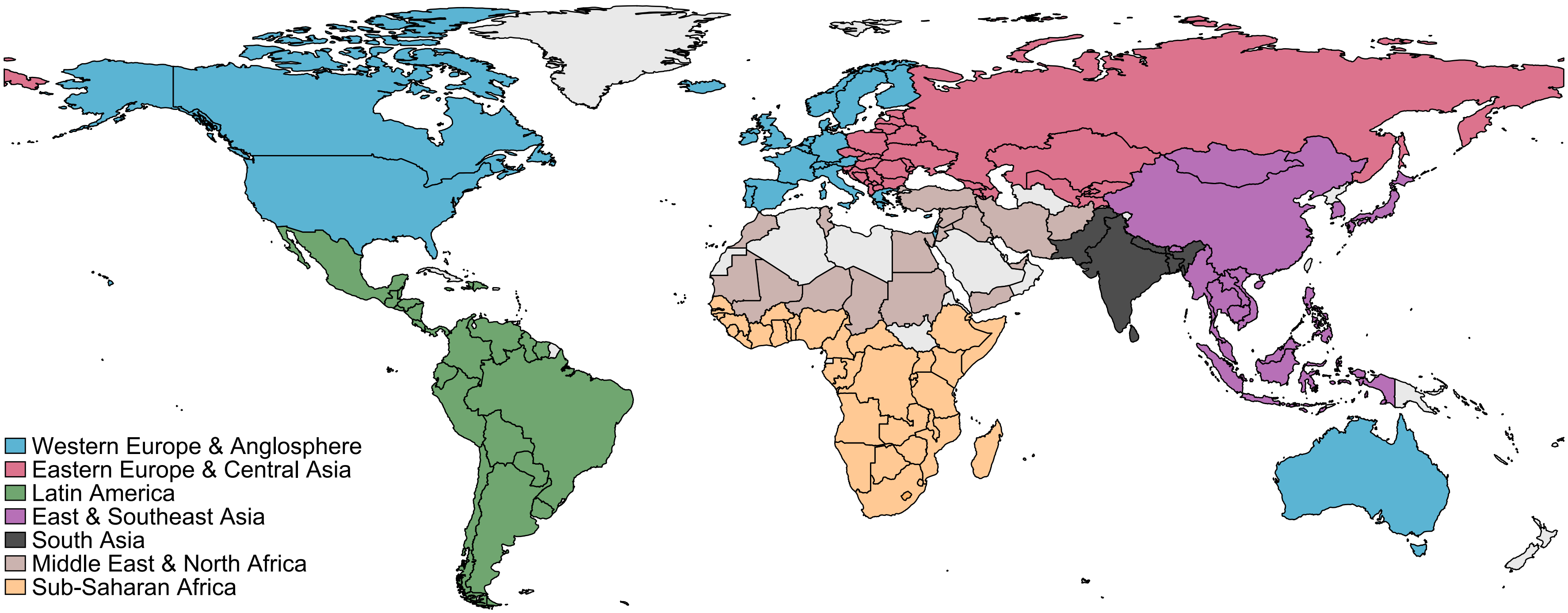
Appendix B. Regression Results without Population Weights

Appendix C. Additional Methodological Details

Appendix D. Labor Supply Model

Appendix A. Additional Main Figures and Tables

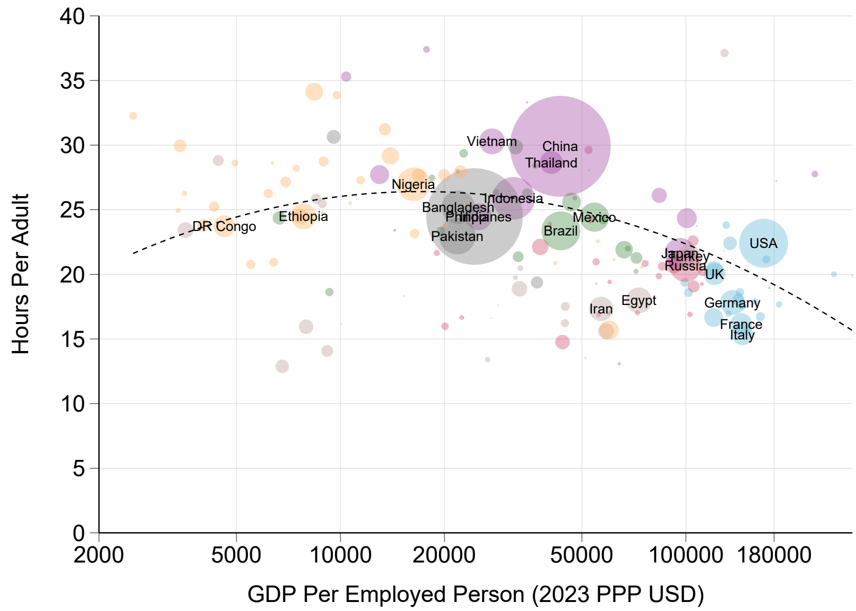
Figure A1: Data Coverage and World Regions



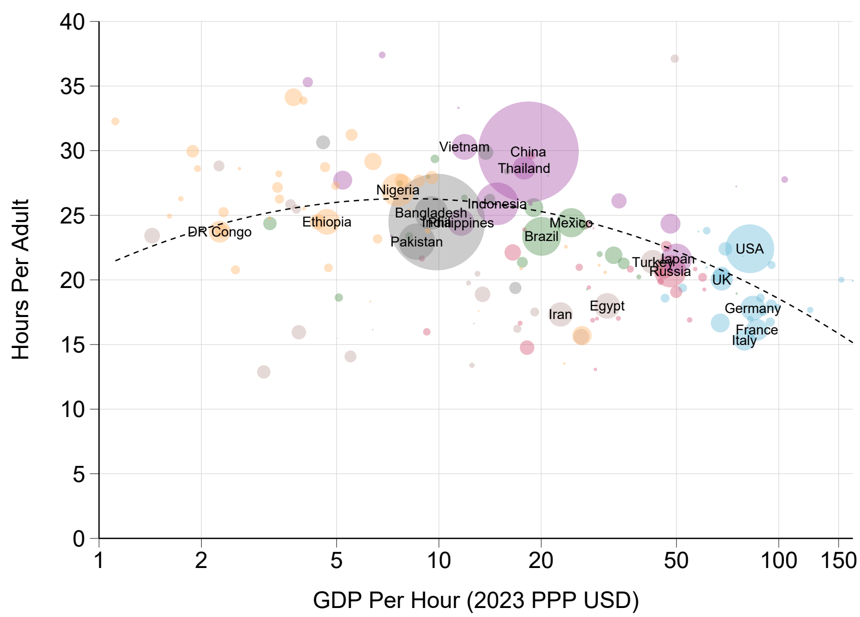
Notes: The figure depicts all the countries for which recent hours worked survey data are available for our analysis as well as the regional breakdown that we will use. Relative to the usual partition of countries by regions, the region Middle East and North Africa is expanded to include Saharian/Sahel countries (Tchad, 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. 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 Soudan (6m).

Figure A2: Hours Worked among All Adults by Country Income (GDP per Worker/per Hour)

(a) Hours Worked and GDP per Worker



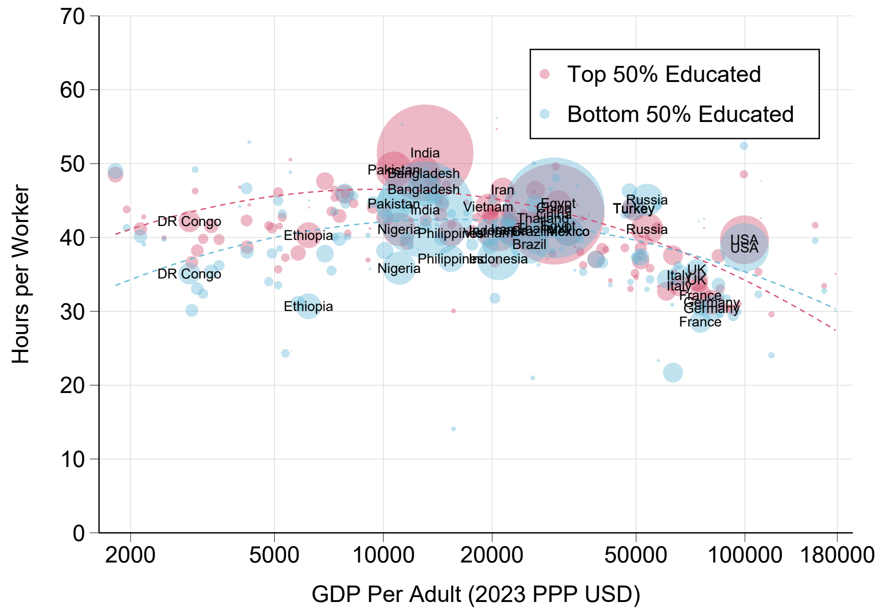
(b) Hours Worked and GDP per Hour



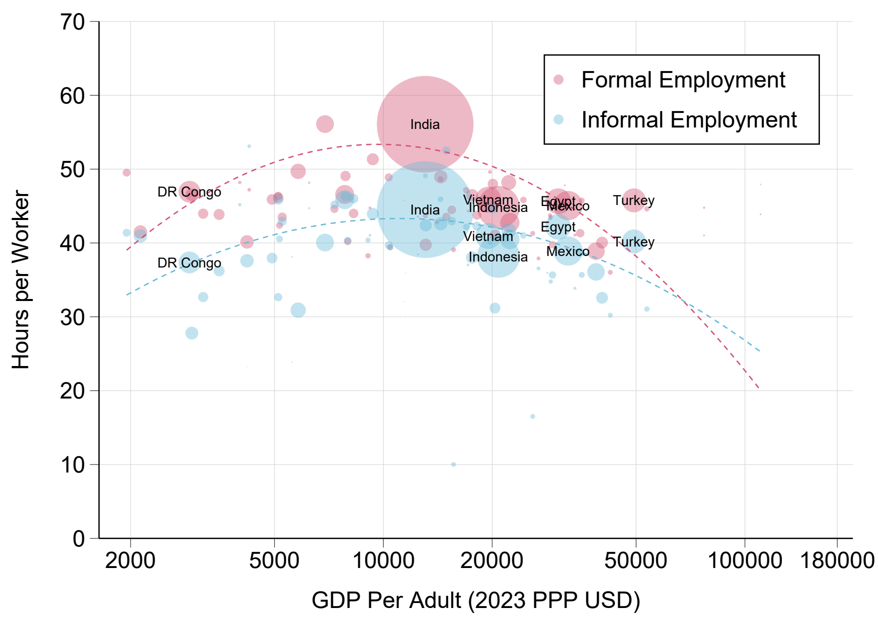
Notes: The figure reproduces Figure 2, panel (a) but replacing the x-axis by GDP per employed person (panel (a)) and GDP per hour (panel (b)) instead of GDP per adult in Figure 2(a). In both panels, the main pattern of hours worked over the course of development is very similar to the one depicted on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

Figure A3: Hours per Worker by Education and Informality

(a) Hours Worked by Broad Education Group

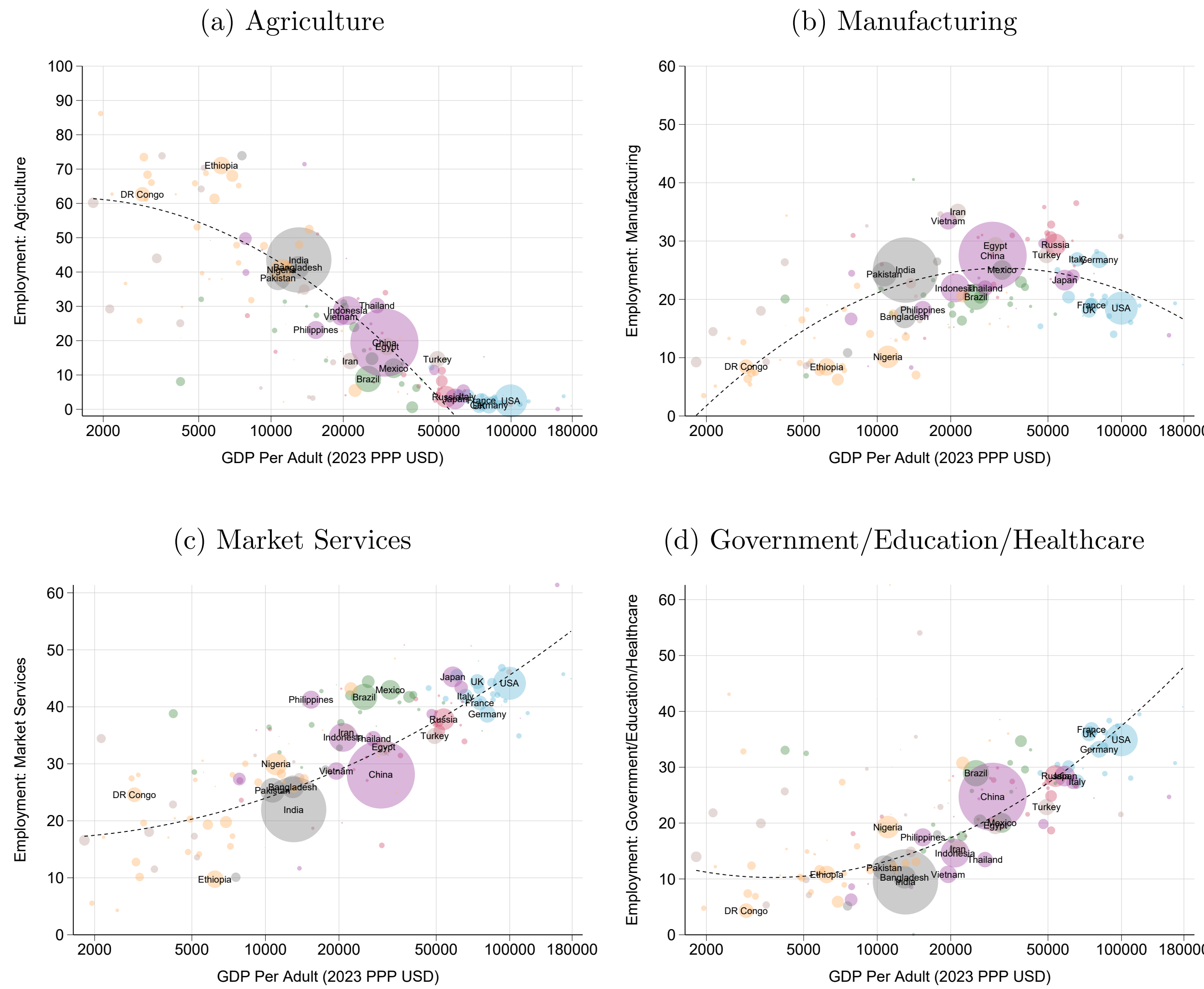


(b) Hours Worked by Informality



Notes: The figure depicts average hours conditional on being employed among the most 50% educated workers and the least 50% 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). Each country's circle's area 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- 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)).

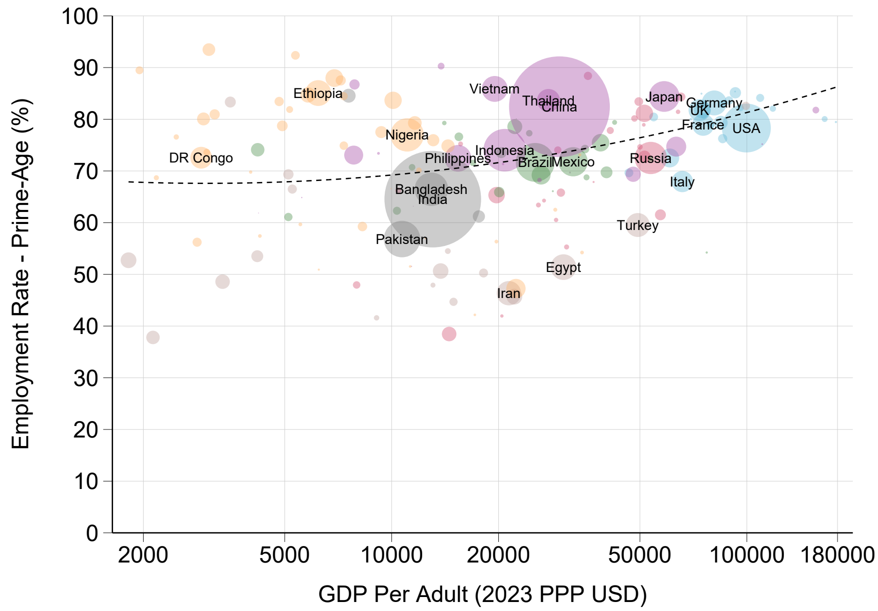
Figure A4: Employment by Sector Over the Course of Development



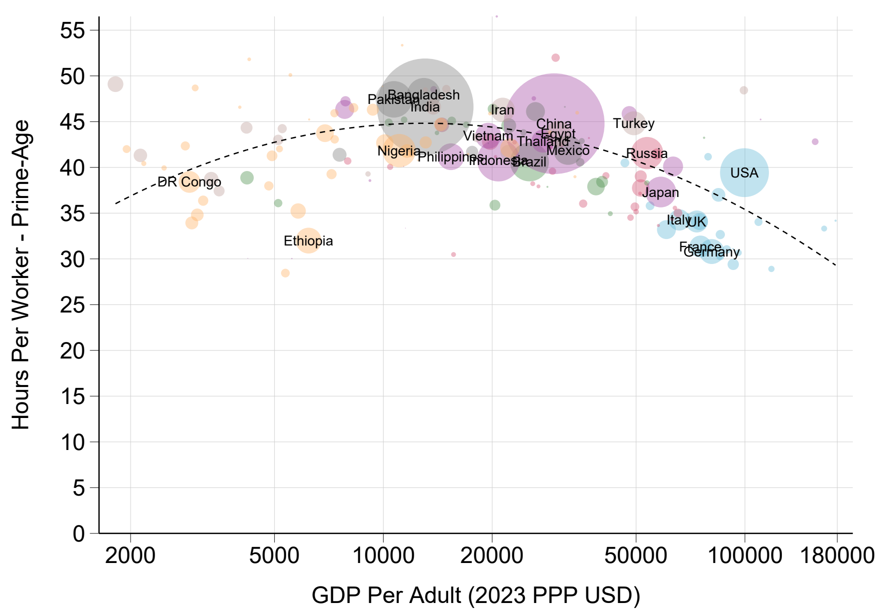
Notes: The figure depicts employment rates (among all adult workers) by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table C1). Each country's 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 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 A5: Hours Worked among Prime-Age Adults: Extensive vs. Intensive Margins

(a) Employment Rate



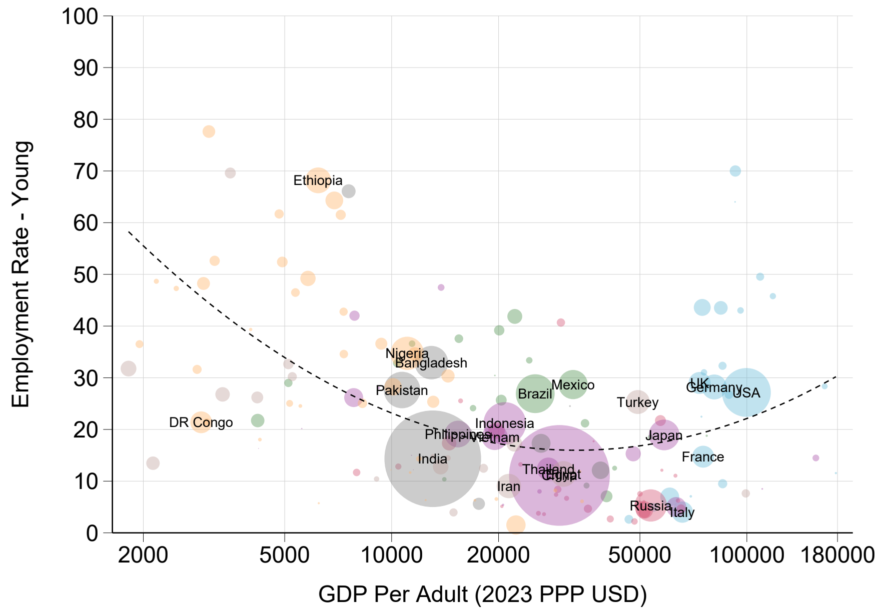
(b) Hours per Worker



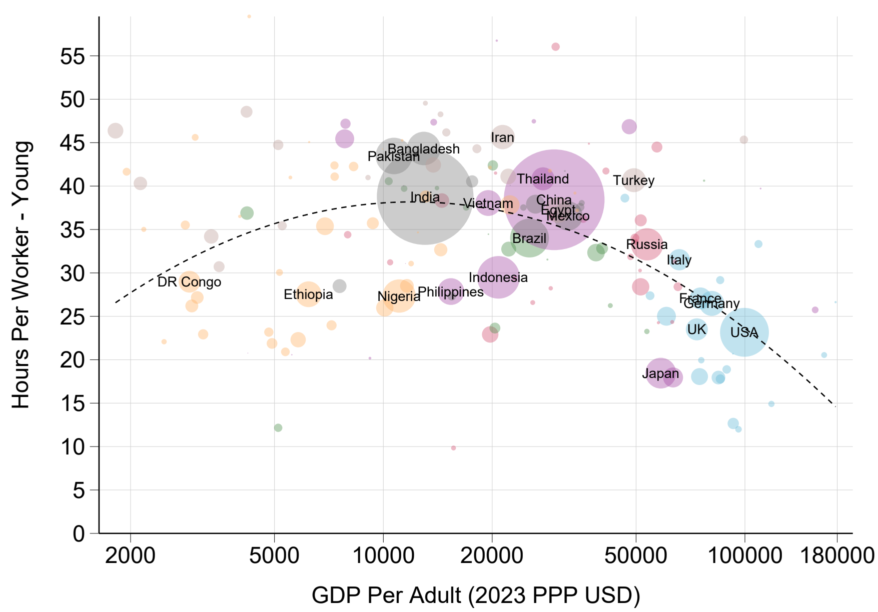
Notes: The figure depicts average hours worked among prime-age adults (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 5(a) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, 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). 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. The employment rate of prime-age adults increases with development while hours per worker are bell shaped with development.

Figure A6: Hours Worked among Young Adults: Extensive vs. Intensive Margins

(a) Employment Rate



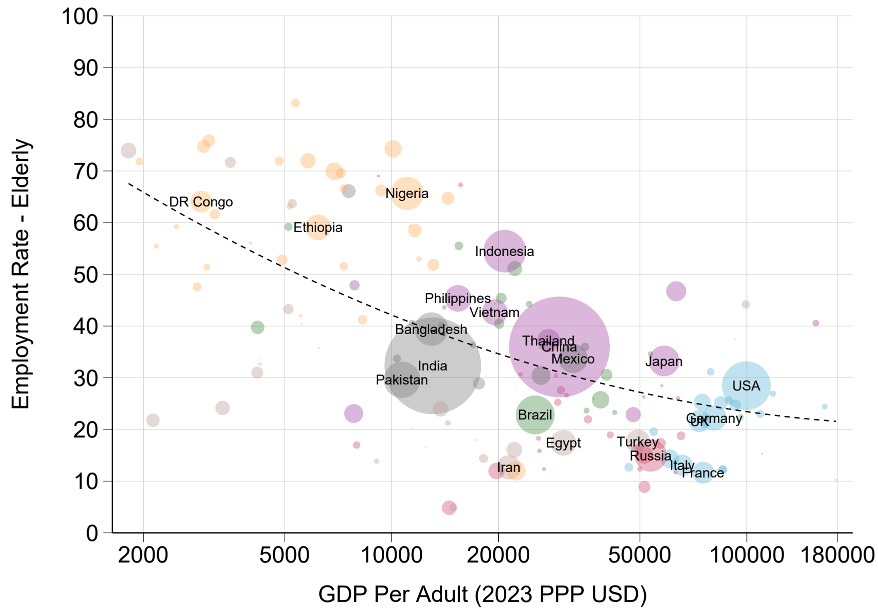
(b) Hours per Worker



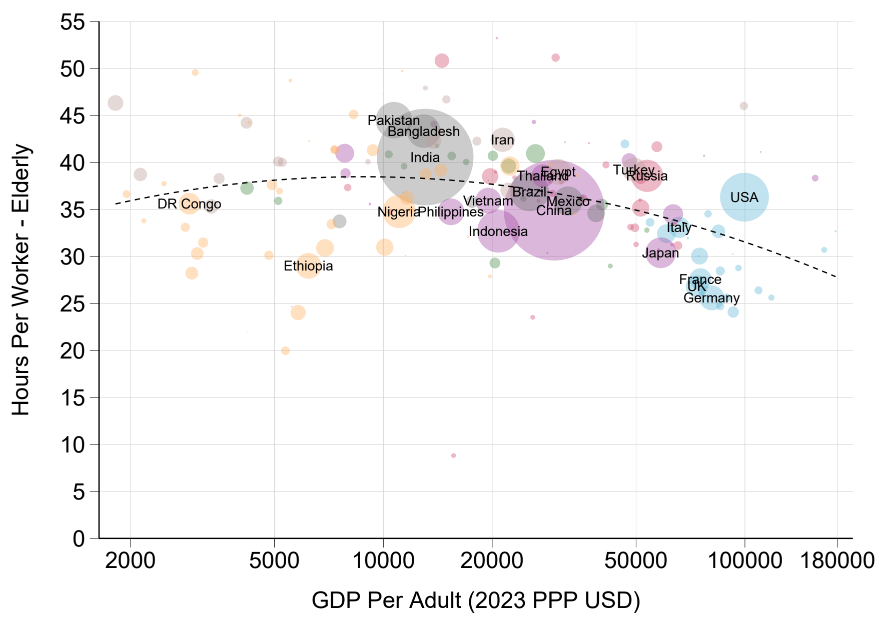
Notes: The figure depicts average hours worked among the young (age 15-19) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 5(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table C1). 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. The employment rate of young workers is U-shaped with development while hours per worker are bell shaped with development.

Figure A7: Hours Worked among the Elderly: Extensive vs. Intensive Margins

(a) Employment Rate

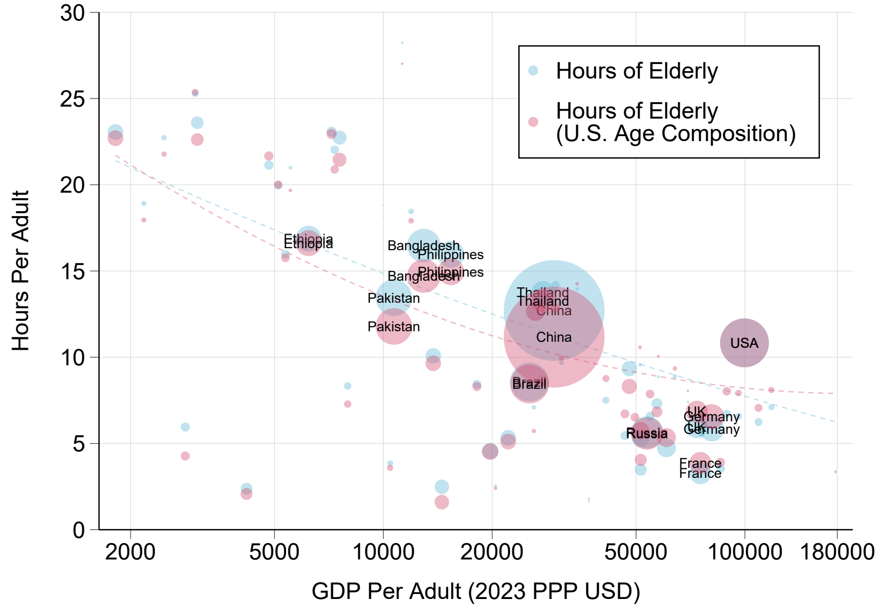


(b) Hours per Worker



Notes: The figure depicts average hours worked among the elderly (age 60+) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text 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). 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. The employment rate of elderly workers decreases with development while hours per worker slightly decrease with development.

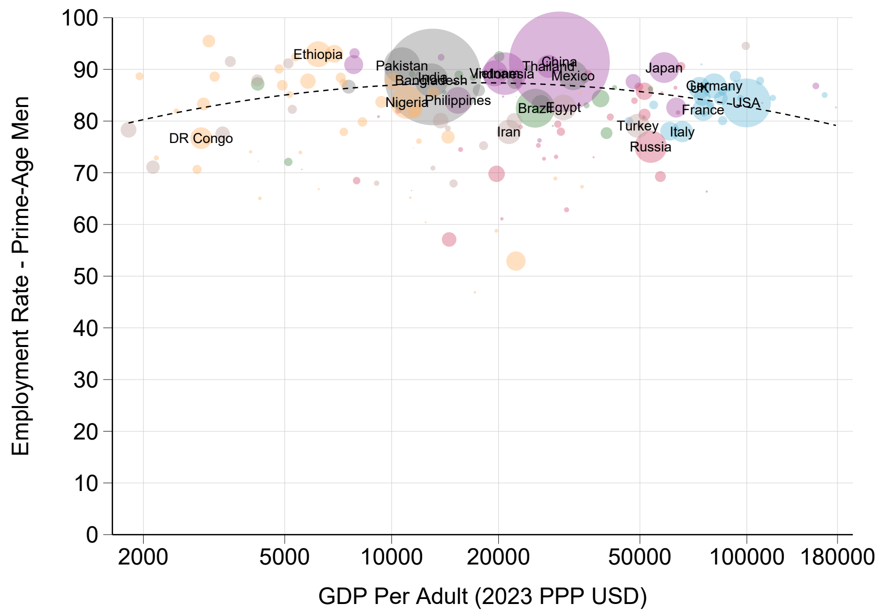
Figure A8: Hours Worked by the Elderly: Controlling for the Age Structure



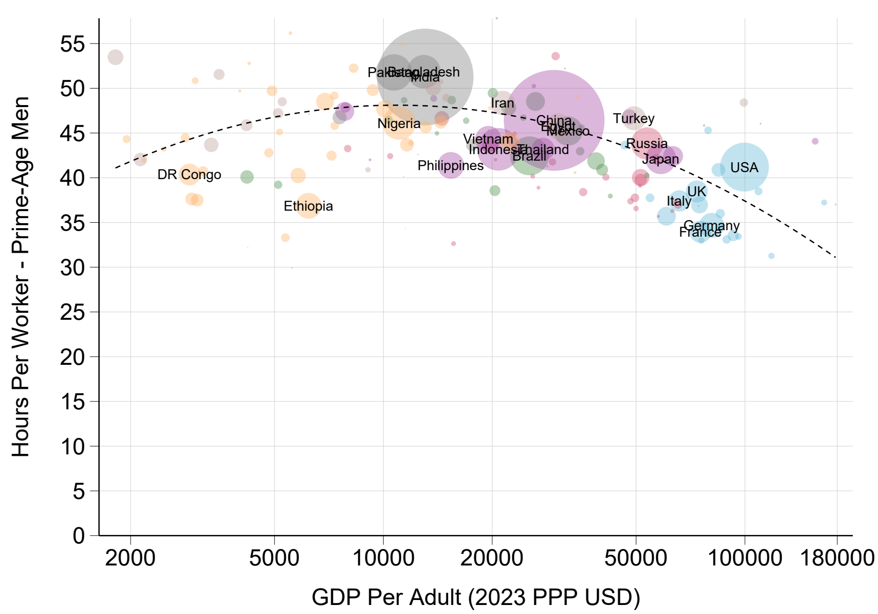
Notes: The figure compares actual hours of work of the elderly (aged 60+) to hours of work of the elderly after reweighing each age group to match the U.S. age composition. The sample is restricted to countries with detailed information on the distribution of age within the group of adults aged 60+. 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 A9: Hours of Work of Prime-Age Men: Extensive vs. Intensive Margins

(a) Employment Rate



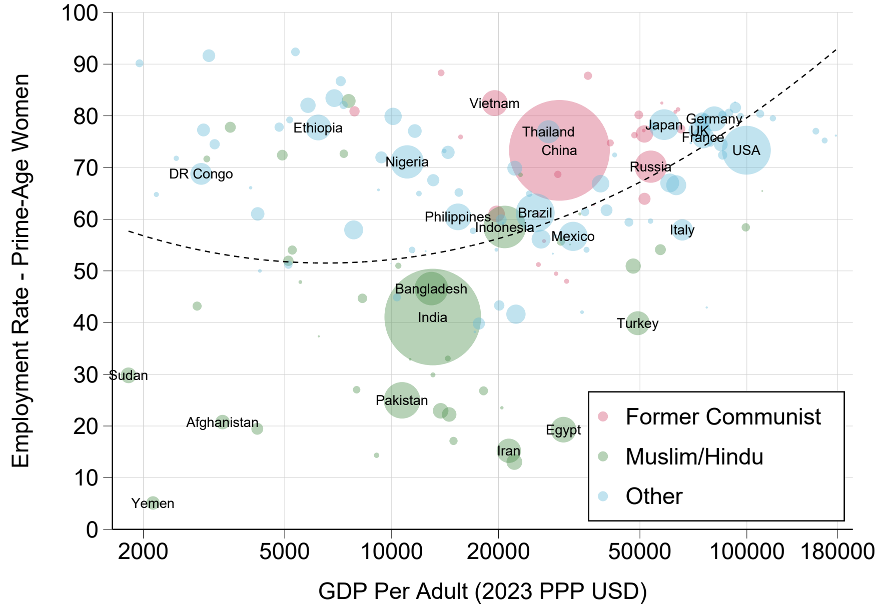
(b) Hours per Worker



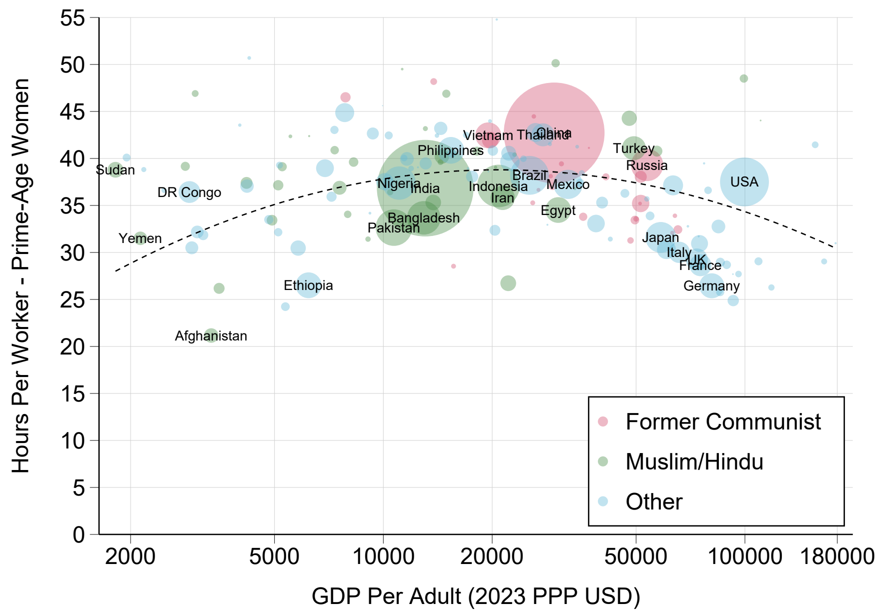
Notes: The figure depicts average hours worked among prime-age men (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table C1). 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. The employment rate of prime-age men is stable with development while hours per worker are bell shaped with development.

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

(a) Employment Rate



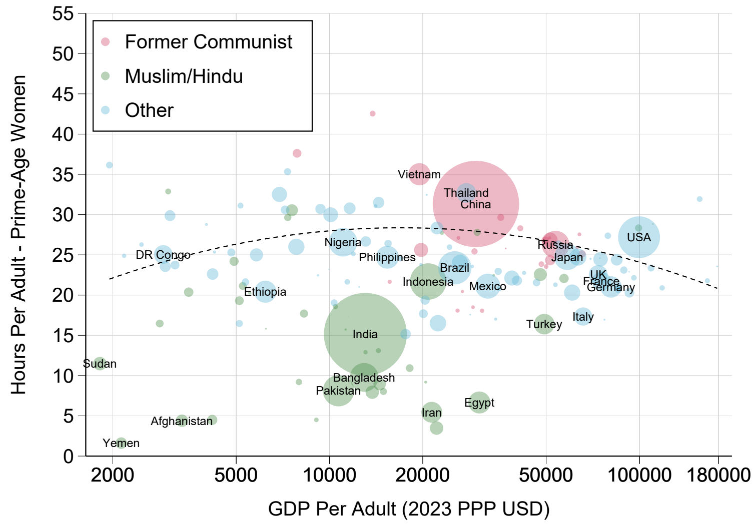
(b) Hours per Worker



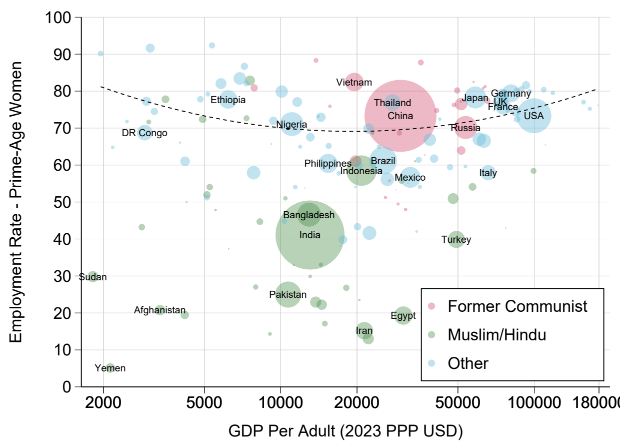
Notes: The figure depicts average hours worked among prime-age women (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table C1). Each country's circle's area 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 A11: Hours of Work of Prime-Age Women (Fit Excluding Muslim/Hindu Countries)

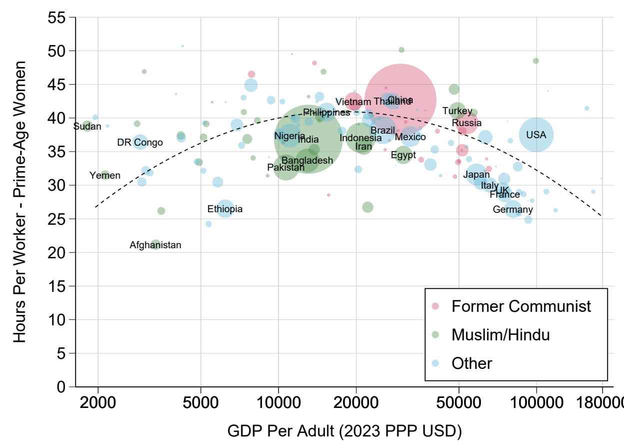
(a) Hours per Adult



(b) Employment Rate

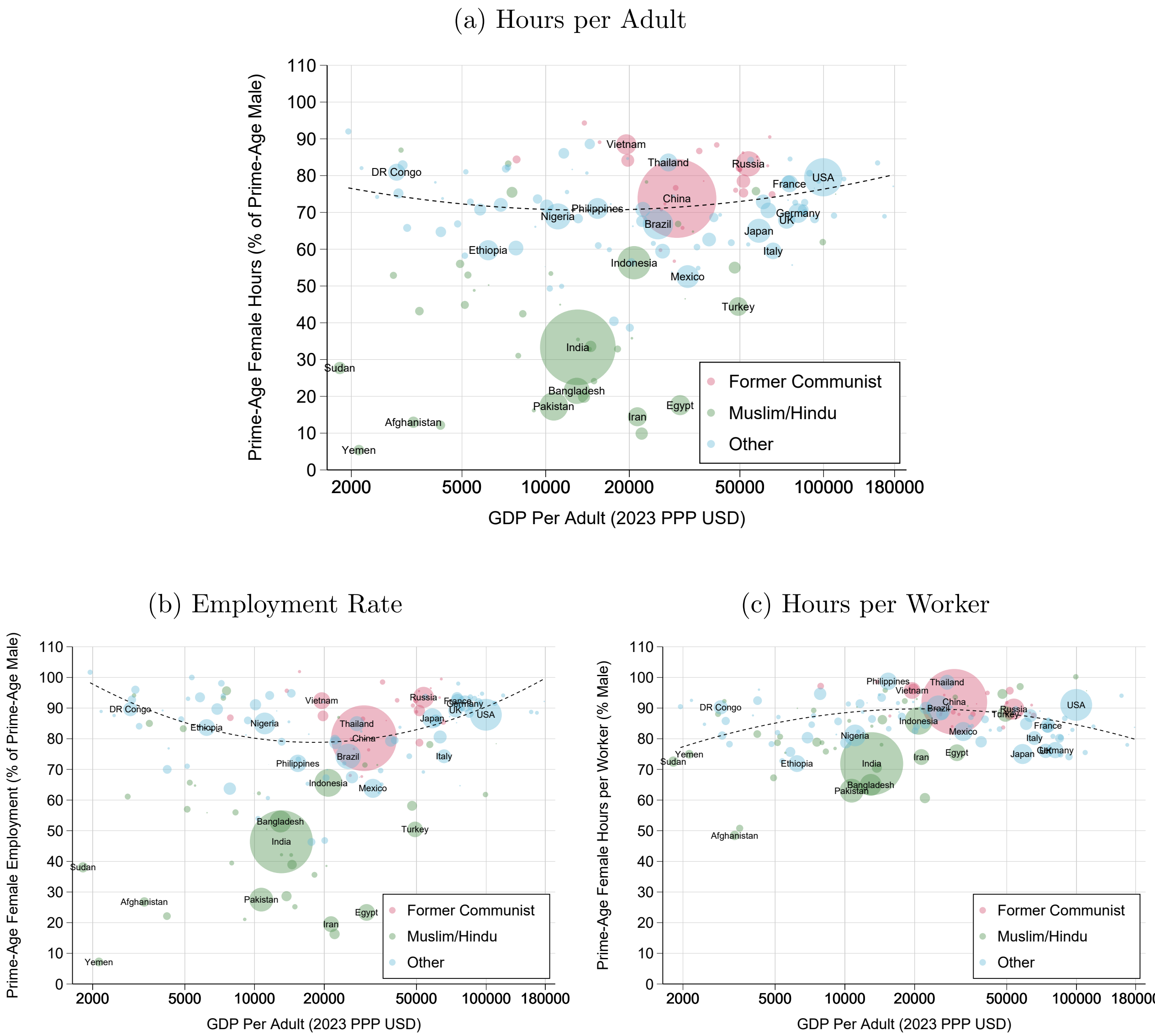


(c) Hours per Worker



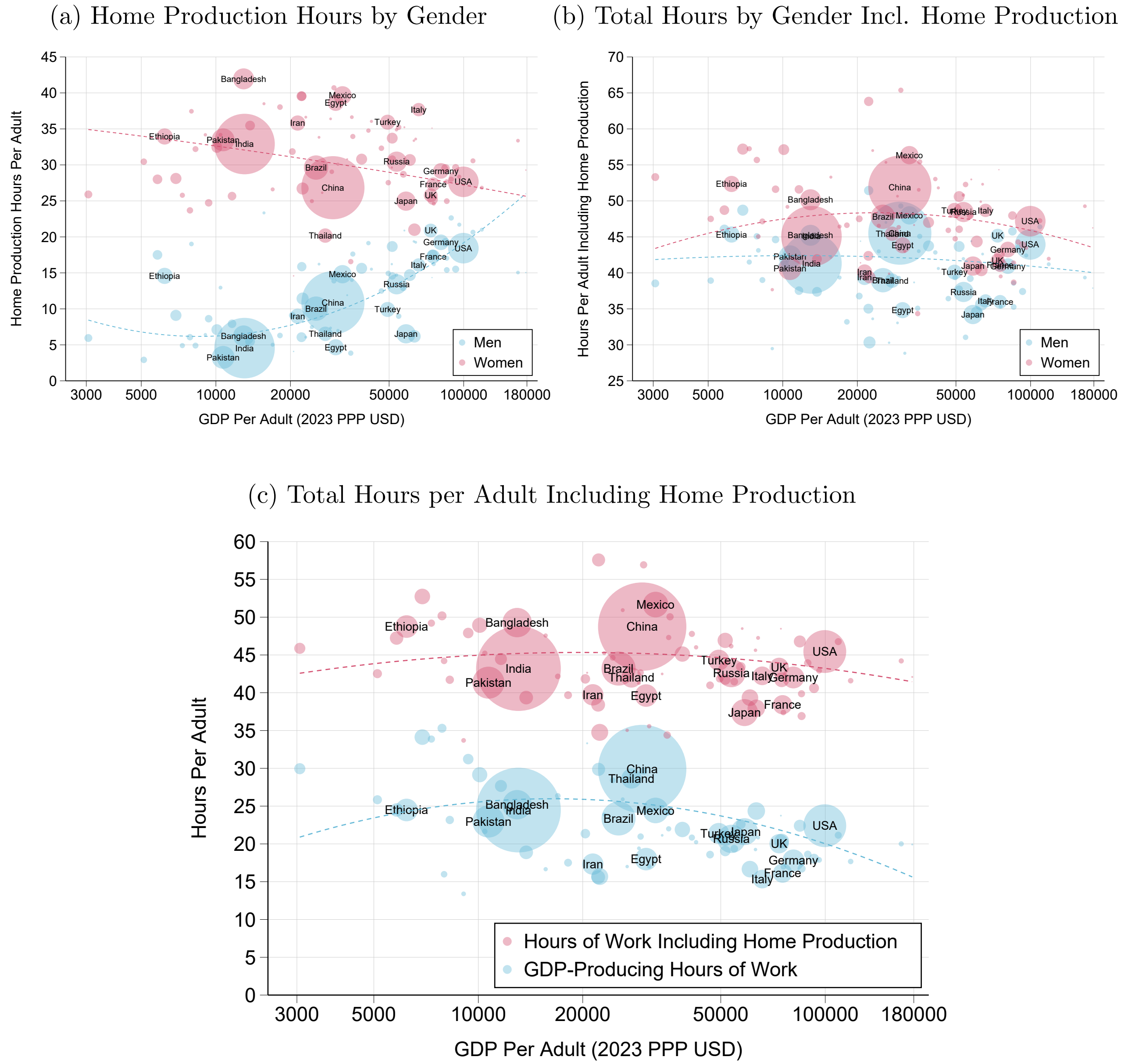
Notes: The figure depicts average hours worked among prime-age women (age 20-59) against GDP per adult in 2023 PPP USD. Panel(a) plots unconditional hours. Panel (b) plots employment rates and Panel (c) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table C1). Each country's circle's area is proportional to its adult population; the largest countries' names are depicted. Colors group countries in 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 A10(a)-(b) for the best quadratic fit including all countries). Excluding Muslim/Hindu countries, hours of work of prime-age women is slightly bell-shaped with development; the employment rate of prime-age women is slighly U-shaped with development while hours per worker are strongly bell shaped with development.

Figure A12: The Gender Gap in Hours Worked (Fit Excluding Muslim/Hindu Countries)



Notes: The figure depicts the ratio of average hours worked among prime-age women (age 20-59) to average hours worked among prime-age men (age 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). Each country's circle's area is proportional to its adult population; the largest countries' names are depicted. Colors group countries in 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).

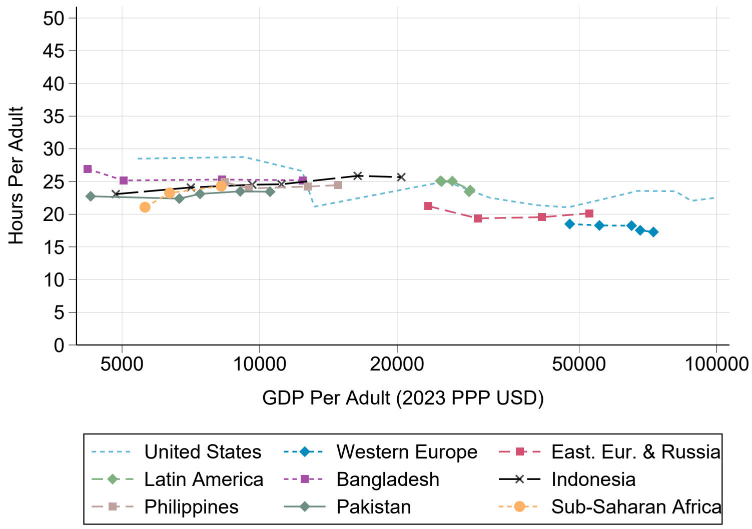
Figure A13: Hours Worked by Gender: Accounting for Domestic Work



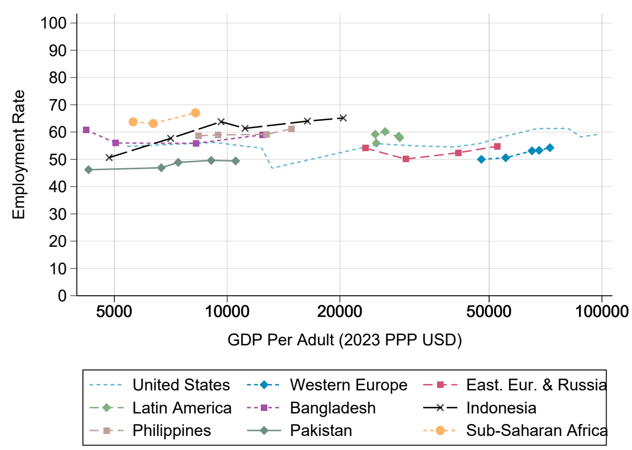
Notes: The figure depicts home production hours and total hours of work including home production against GDP per adult in 2023 PPP USD. Panel (a) plots home production hours by gender, based on estimates from time use surveys compiled by Charmes (2022). Panel (b) adds these estimates of home production 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 A14: Evolution of Hours Worked, All Adults: Extensive vs. Intensive Margins

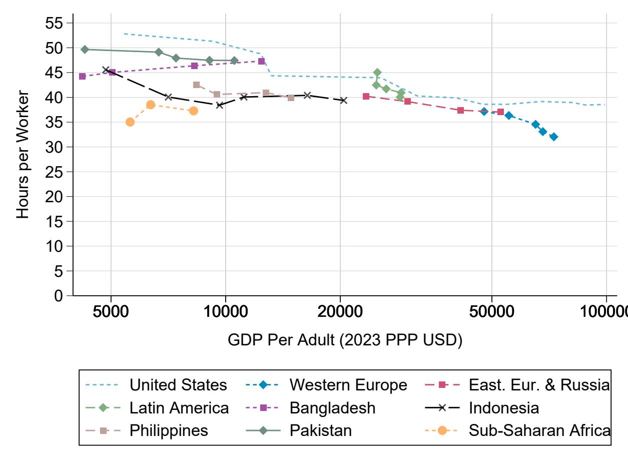
(a) Hours per Adult



(b) Employment Rate



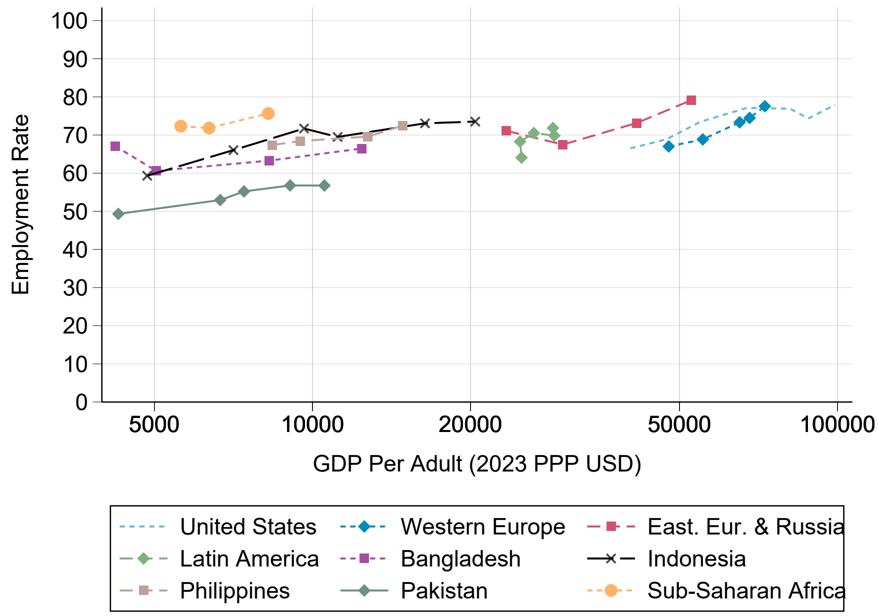
(c) Hours per Worker



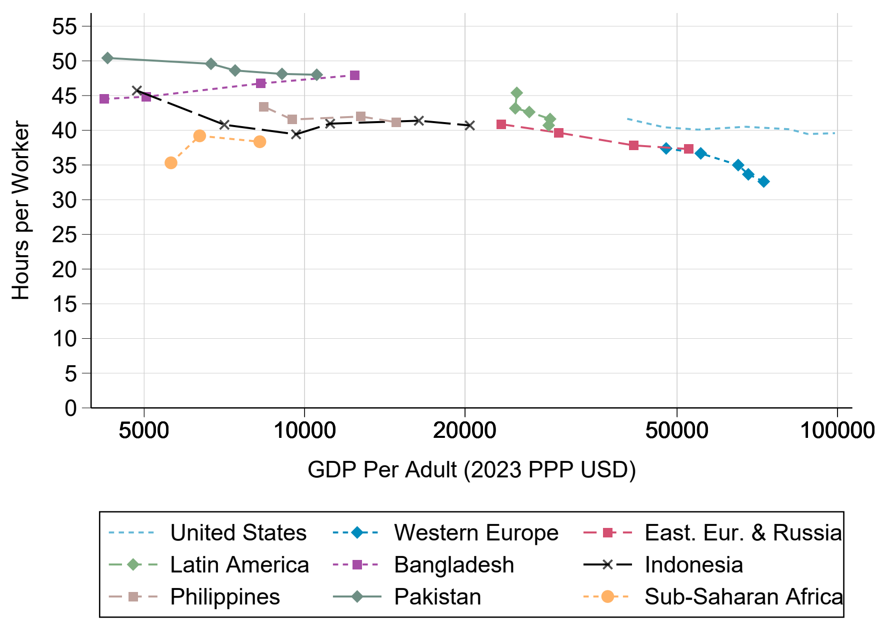
Notes: The figure depicts the evolution by decade of (a) hours per adult, (b) employment rates, and (c) hours per worker among all adults for some regions and countries for which we have long time series (covering 3 decades or more). The estimates are plotted against country or region GDP per adult in 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 overtime while hours per worker tend to decrease over time.

Figure A15: Evolution of Hours Worked, Prime-Age Adults: Extensive vs. Intensive Margins

(a) Employment Rate



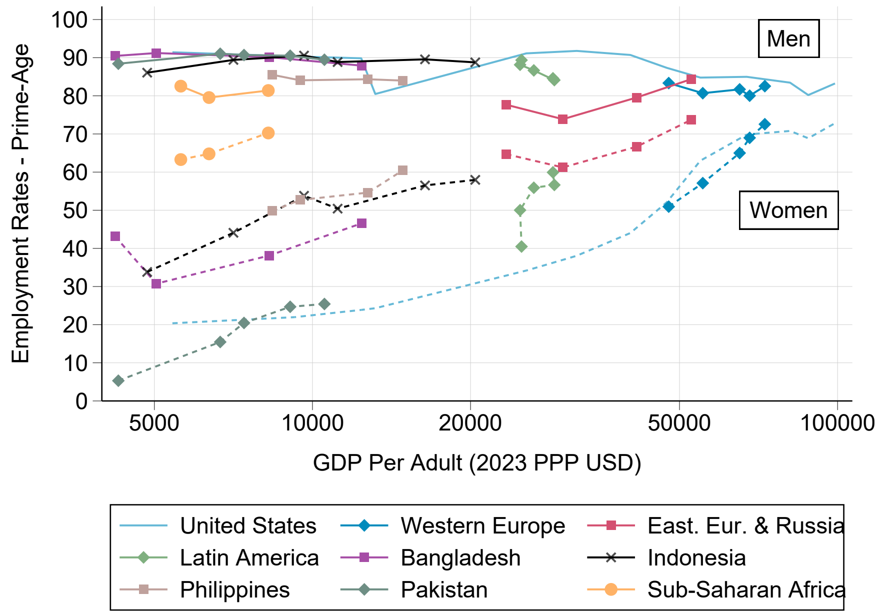
(b) Hours per Worker



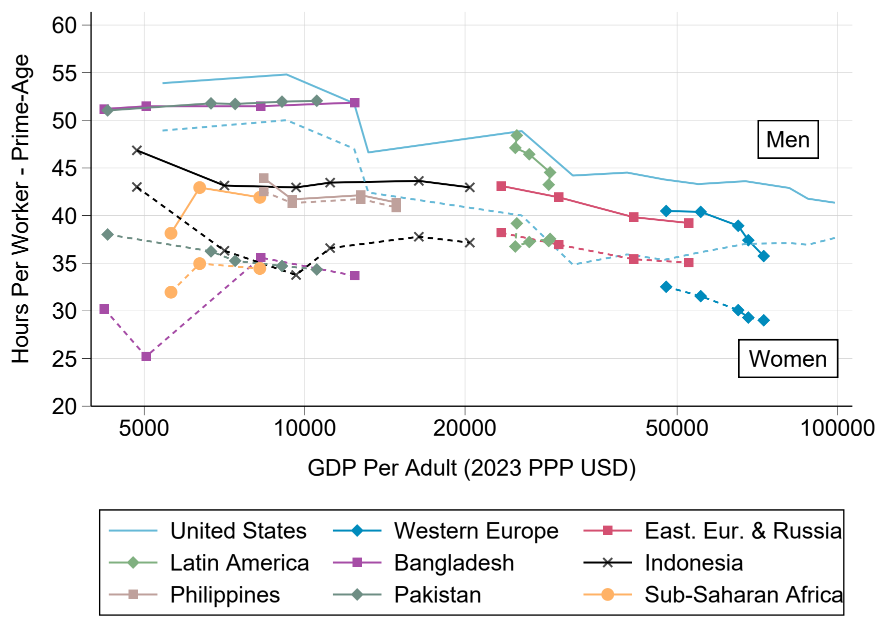
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age adults (see main text Figure 9(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the 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 overtime. Hours per worker tend to be stable for lower income countries/regions and decreasing in richer countries/regions.

Figure A16: Evolution of Hours Worked by Gender: Extensive vs. Intensive Margins

(a) Employment Rate



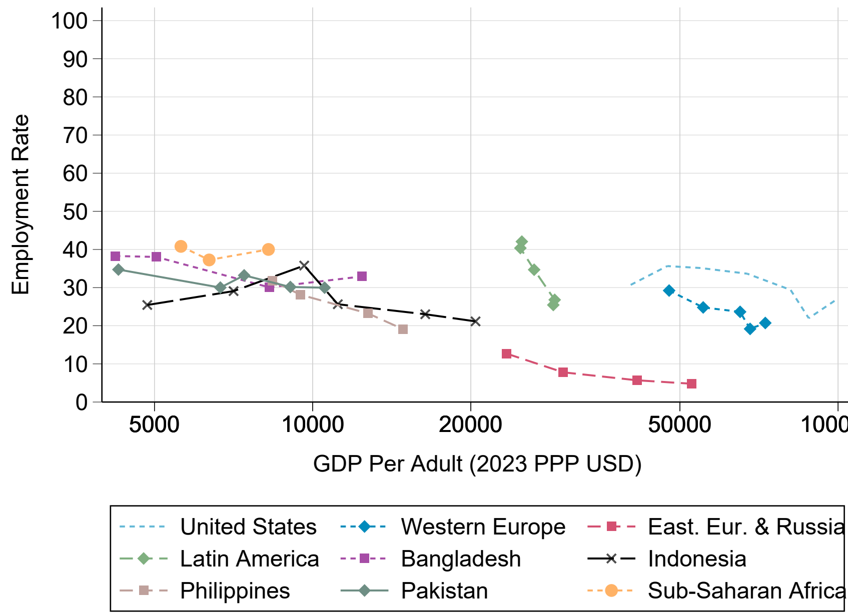
(b) Hours per Worker



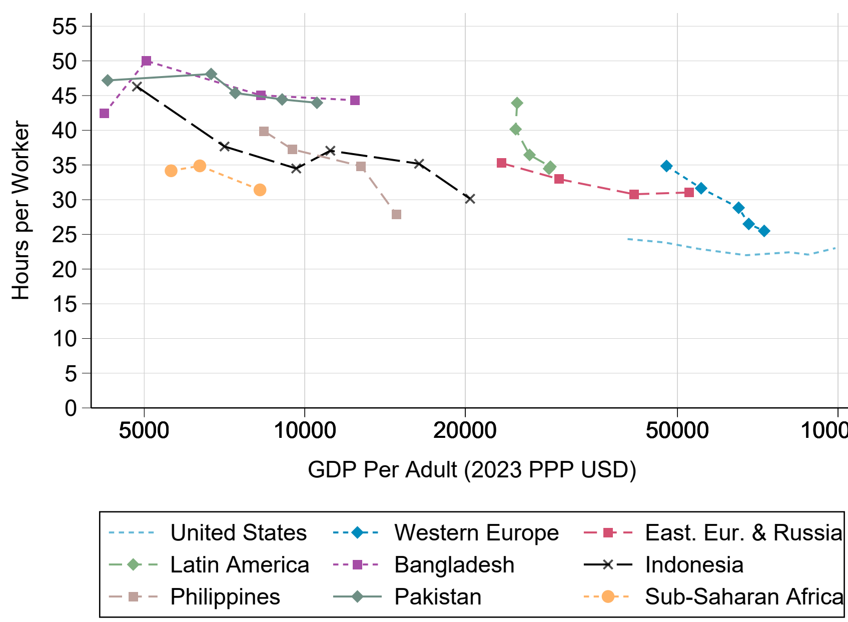
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age men and women (see main text Figure 9(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). 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 about stable overtime. 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 overtime 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 A17: Evolution of Hours Worked, Young Adults: Extensive vs. Intensive Margins

(a) Employment Rate



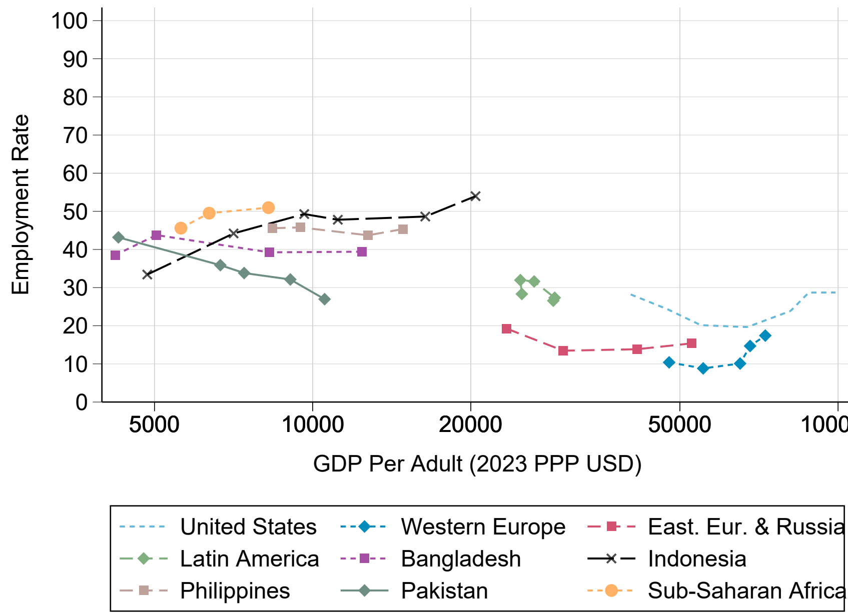
(b) Hours per Worker



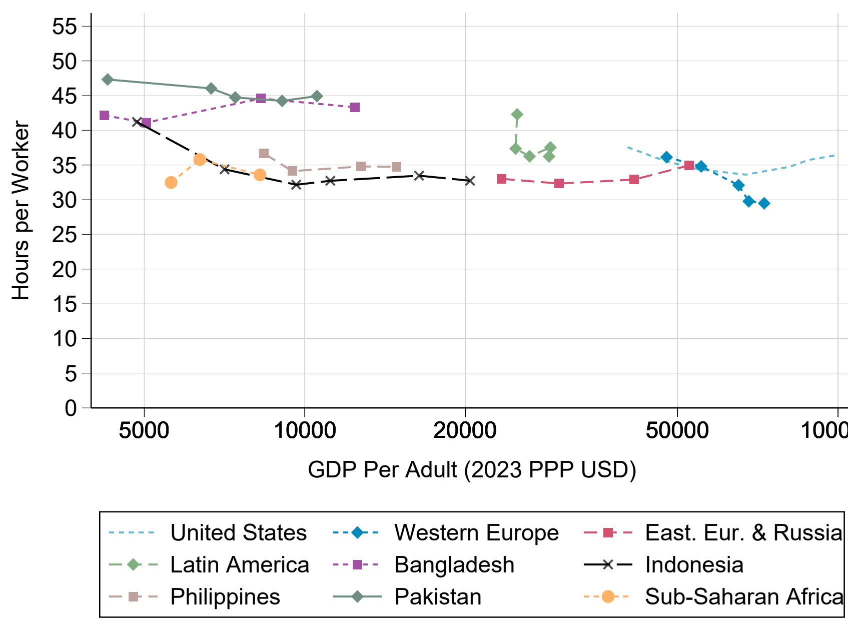
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among young adults aged 15-19 (see main text Figure 10(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). 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 overtime everywhere, and often sharply so. Hours per worker for young adults are generally stable within countries/regions, and sometimes decreasing.

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

(a) Employment Rate

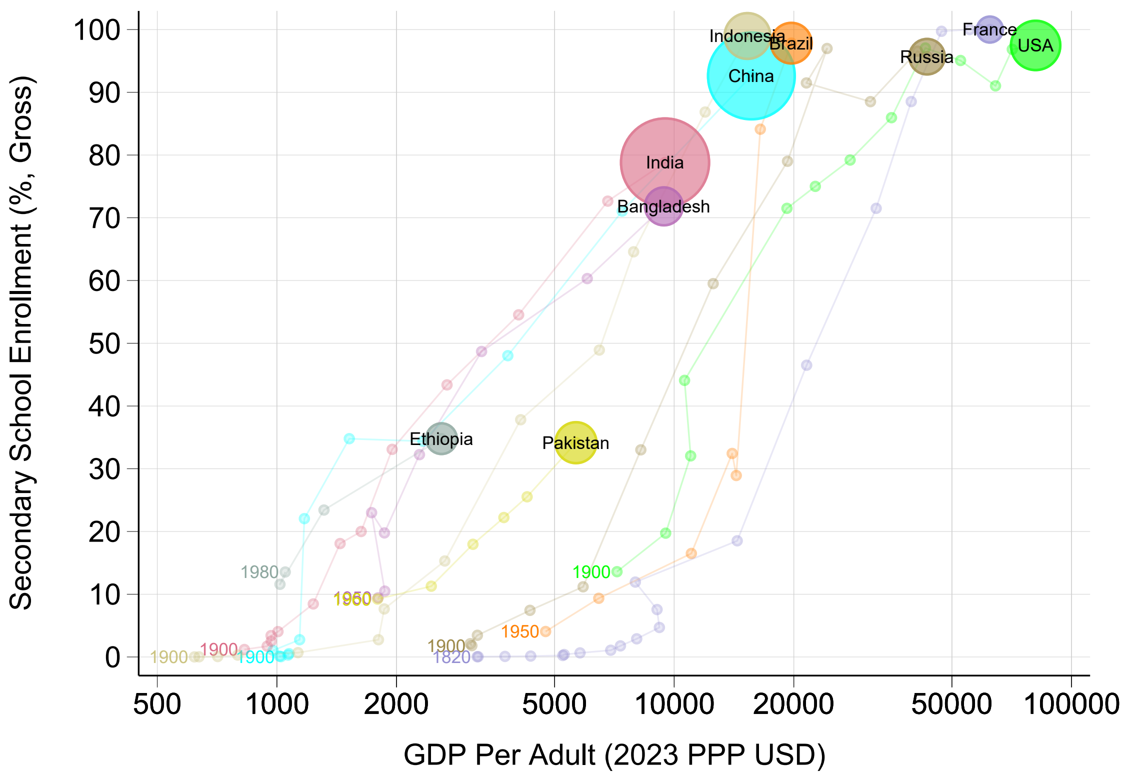


(b) Hours per Worker



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 for older adults are generally stable or slightly increasing overtime within countries/regions. Hours per worker for older adults are generally stable within countries/regions, and sometimes decreasing.

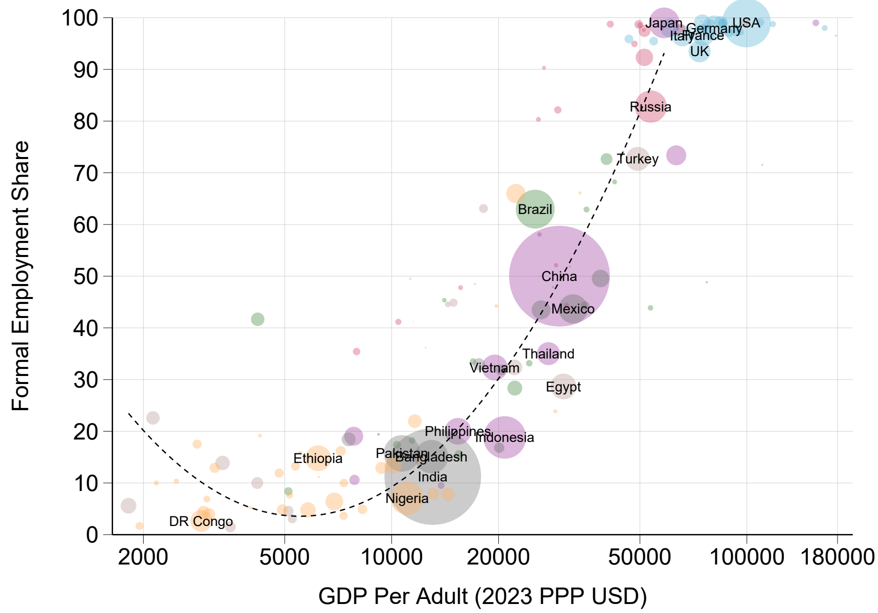
Figure A19: Secondary School Attendance and Development in the Long Run



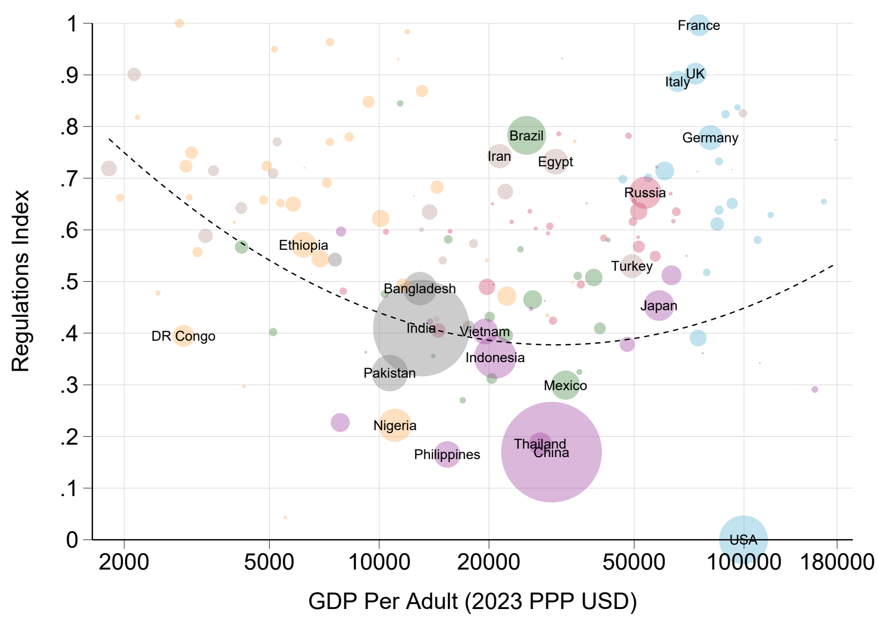
Notes: The figure depicts the evolution of gross secondary school enrollment by decade in selected countries from 1820 to 2010, based on data from Lee and Lee (2016). Estimates are plotted against country per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is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

Figure A20: Formal Employment and Regulations vs. GDP per adult

(a) Fraction Workers Formal



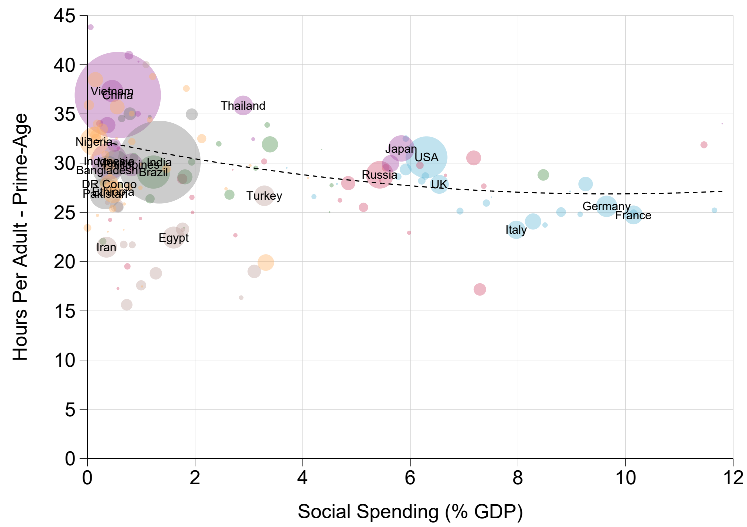
(b) Regulation index



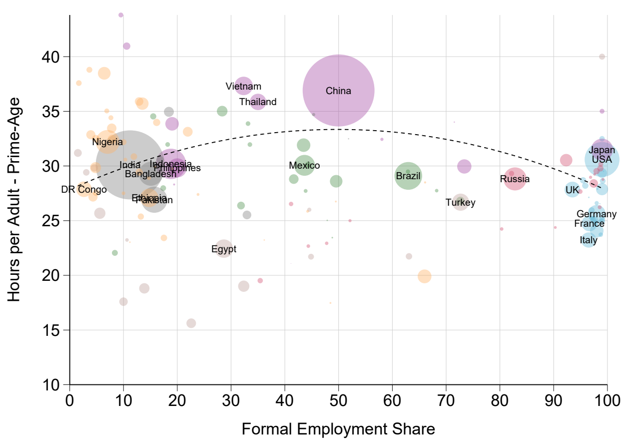
Notes: Panel (a) depicts the fraction of formal workers (among all workers) against GDP per adult in 2023 PPP USD. Panel (b) depicts the working hours regulation index by country created using the working hours regulations variables compiled in the World Bank Employing Workers database. Panel (a) shows 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 very large heterogeneity across countries.

Figure A21: Social Spending, Formality, and Regulations vs. Hours per Prime-Age Adult

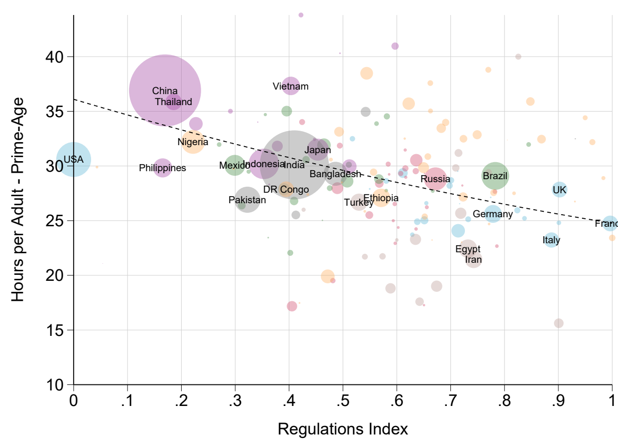
(a) Social Assistance Spending Relative to GDP



(b) Fraction Workers Formal



(c) Regulation Index



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 regulation index vs. hours of work by country. The working hours regulation index by country is created using the working hours regulations variables compiled in the World Bank Employing Workers database. 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.

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 regions in rows (regions are defined on 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 by 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

					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
Log GDP Per Adult	1.17**	-1.94	0.54	0.92**	1.32***	0.95***	0.34**	0.31	1.05***	-0.72
	(0.52)	(1.21)	(0.95)	(0.45)	(0.35)	(0.27)	(0.16)	(1.27)	(0.39)	(1.09)
Log GDP per Adult Squared	-0.06**	0.08	-0.04	-0.05**	-0.07***	-0.05***	-0.02**	-0.01	-0.05***	0.05
	(0.03)	(0.06)	(0.05)	(0.02)	(0.02)	(0.01)	(0.01)	(0.06)	(0.02)	(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 R2	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.

Table A4: Elasticities of Prime-Age Hours Worked: Sensitivity to Alternative Samples and Empirical Specifications

	Population-Weighted			No Weight		
	Coefficient	SE	R^2	Coefficient	SE	R^2
A. Cross Section						
Bick et al. 2018 Core Sample	-0.036	(0.037)	0.046	-0.066***	(0.024)	0.154
Bick et al. 2018 Full Sample	-0.034	(0.028)	0.041	-0.048***	(0.017)	0.081
Full Sample	**0.02**	**(0.023)**	**0.010**	**0.006**	**(0.014)**	**0.001**
Excluding China and India	0.004	(0.016)	0.001	0.005	(0.014)	0.001
Excluding Small and Oil Countries	0.021	(0.024)	0.014	-0.006	(0.015)	0.002
Controlling for Muslim/Hindu Share	-0.023	(0.019)	0.173	-0.019	(0.014)	0.106
Controlling for Region Fixed Effects	0.039	(0.032)	0.577	0.039	(0.026)	0.214
Controlling for Both	0.029	(0.031)	0.618	0.014	(0.025)	0.291
Using Fixed Weights by Age-Gender	0.011	(0.025)	0.003	-0.013	(0.015)	0.005
B. Panel Data						
Full Sample	**0.042*** **	**(0.010)**	**0.032**	**0.026*** **	**(0.006)**	**0.008**
Low/Lower-Middle-Income Countries	0.064***	(0.013)	0.158	0.046***	(0.014)	0.036
Upper-Middle/High-Income Countries	0.033**	(0.013)	0.016	0.022***	(0.007)	0.006
Muslim/Hindu Countries	0.084***	(0.012)	0.340	0.119***	(0.017)	0.167
Western European Countries	-0.135***	(0.027)	0.185	-0.026**	(0.011)	0.011
Other Countries	0.004	(0.015)	0.000	0.025***	(0.009)	0.007

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 A5: 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
Panel A: Cross Section								
Log GDP Per Adult	0.18**	0.19***	0.13**	0.13*	-0.04*	-0.02	-0.08***	-0.06**
	(0.07)	(0.07)	(0.06)	(0.07)	(0.02)	(0.02)	(0.02)	(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
Panel B: Panel Data								
Log GDP Per Adult	0.36***	0.43***	0.18***	0.10***	-0.13***	-0.12***	-0.16***	-0.05**
	(0.03)	(0.04)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(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 per prime-age men and per 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 129 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 (4), 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 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 A6: 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
$\log 1 - \tau(L)$	0.578***	0.185**	0.500***	-0.304**	0.629***	-0.793**
	(0.101)	(0.091)	(0.067)	(0.118)	(0.098)	(0.369)
N	126	126	126	126	126	126
Adjusted R-Squared	0.24	0.03	0.45	0.10	0.41	0.07

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 A7: 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***	0.38***	0.63***	-0.25***	0.91***	-0.50***
	(0.07)	(0.06)	(0.04)	(0.04)	(0.05)	(0.11)
Log GDP Per Adult	0.05***	0.07***	-0.03***	0.10***	-0.05***	0.29***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
N	1959	1959	1959	1959	1959	1959
Adjusted R2	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***	0.27***	0.42***	-0.16***	0.36***	0.16
	(0.09)	(0.08)	(0.05)	(0.05)	(0.07)	(0.13)
Log GDP Per Adult	0.13***	0.11***	0.05***	0.06***	0.17***	0.02
	(0.03)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)
N	1959	1959	1959	1959	1959	1959
Adjusted R2	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 and display overall similar results.

Table A8: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations, Including Pension Spending

	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
A. Before Controls						
$\log 1-\tau(L)$	1.09***	0.76***	0.67***	0.10	0.72***	0.734**
	(0.19)	(0.17)	(0.13)	(0.13)	(0.17)	(0.284)
B. Controlling for Social and Pension Spending						
$\log 1-\tau(L)$	0.70***	0.66***	0.57***	0.08	0.68***	0.640
	(0.16)	(0.15)	(0.12)	(0.15)	(0.13)	(0.459)
Social Spending	-0.042***	-0.032***	-0.029***	-0.004	-0.036***	-0.022
	(0.010)	(0.009)	(0.006)	(0.007)	(0.008)	(0.016)
Pension Spending	-0.00	0.01	0.02**	-0.01*	0.02*	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.024)
C. Controlling for Social and Pension Spending and Regulations						
$\log 1-\tau(L)$	0.21	0.18	0.41***	-0.21	0.30*	-0.282
	(0.22)	(0.19)	(0.11)	(0.21)	(0.15)	(0.542)
Social Spending	-0.035***	-0.025***	-0.027***	0.001	-0.030***	-0.008
	(0.008)	(0.006)	(0.005)	(0.006)	(0.006)	(0.015)
Pension Spending	-0.00	0.01	0.02**	-0.01*	0.02*	-0.005
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.021)
Formal Employment	-0.36**	-0.35**	-0.00	-0.32*	-0.33**	-0.625
	(0.16)	(0.14)	(0.10)	(0.17)	(0.13)	(0.421)
Labor Regulations Index	-0.16**	-0.16***	-0.11***	-0.05	-0.10**	-0.322
	(0.07)	(0.06)	(0.04)	(0.07)	(0.05)	(0.195)
N	99	99	99	99	99	99
Adjusted R-Squared	0.75	0.69	0.72	0.62	0.76	0.71

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.

Table A9: Elasticities of Prime-Age Hours Worked: By Country Income Group

	All Countries	Low/Lower-Middle Income Countries	Upper-Middle/High Income Countries
Before Controls			
$\log 1-\tau(L)$	0.827***	0.864***	0.721***
	(0.160)	(0.277)	(0.143)
Controlling for Social Spending and Regulations			
$\log 1-\tau(L)$	-0.093	0.109	-0.113
	(0.188)	(0.726)	(0.176)
Social Spending	-0.016*	0.003	-0.019***
	(0.008)	(0.032)	(0.006)
Formal Employment	-0.360**	-1.005***	-0.159
	(0.143)	(0.344)	(0.195)
Labor Regulations Index	-0.210***	-0.040	-0.268***
	(0.074)	(0.157)	(0.075)
N	126	57	69
Adjusted R-Squared	0.56	0.40	0.68

Notes. This table studies the heterogeneity of results reported in the 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. Formal employment is very strongly correlated with lower hours worked in poorer countries, while social spending and labor regulations depress hours of work in richer countries.

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
Panel A: Cross Section										
Log GDP Per Adult	-0.05***	-0.35***	-0.31***	0.01	-0.03***	-0.05***	0.01	0.08**	-0.03**	0.10***
	(0.02)	(0.05)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(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 R2	0.04	0.21	0.31	-0.01	0.04	0.13	0.01	0.03	0.03	0.06
Panel B: Panel Data										
Log GDP Per Adult	-0.02***	-0.91***	0.20***	0.03***	-0.09***	-0.13***	0.03***	0.24***	-0.12***	0.35***
	(0.01)	(0.04)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(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 R2	0.00	0.23	0.03	0.01	0.07	0.28	0.02	0.21	0.18	0.36

Notes. This table repeats 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)

					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
Log GDP Per Adult	0.08	-2.31***	-0.24	0.11	0.36*	0.60***	-0.26*	-0.10	0.90***	-1.00*
	(0.27)	(0.87)	(0.62)	(0.23)	(0.20)	(0.14)	(0.14)	(0.56)	(0.18)	(0.52)
Log GDP per Adult Squared	-0.01	0.10**	-0.00	-0.01	-0.02*	-0.03***	0.01*	0.01	-0.05***	0.06**
	(0.01)	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)	(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 R2	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***		-0.00	0.15**
	(0.05)		(0.05)	(0.07)
Young School Attendance		-4.03***	-4.02***	-3.52***
		(0.29)	(0.38)	(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 R2	0.22	0.56	0.56	0.60

Notes. This table repeats 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***		-0.15**	0.00
	(0.05)		(0.08)	(0.09)
Pension Spending		-5.90***	-6.20***	-5.76***
		(1.61)	(1.59)	(1.50)
Elderly Population Share		-0.13	0.85	0.57
		(0.79)	(0.92)	(0.93)
Pension Coverage		-0.84***	-0.71***	-0.42**
		(0.19)	(0.20)	(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 R2	0.47	0.63	0.64	0.70

Notes. This table repeats 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***		0.03	0.23***
	(0.04)		(0.04)	(0.05)
Muslim/Hindu Share		-0.69***	-0.67***	-0.58***
		(0.09)	(0.09)	(0.08)
Former Communist Country		0.18**	0.18**	0.21**
		(0.08)	(0.09)	(0.08)
% Women Living with Young Children		0.16	0.28	0.01
		(0.18)	(0.23)	(0.21)
Employment: Agriculture				1.18***
				(0.24)
Employment: Manufacturing				-0.98*
				(0.55)
Mean Hours	22.1	22.1	22.1	22.1
N	132	132	132	132
Adjusted R2	0.05	0.35	0.35	0.51

Notes. This table repeats 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***	0.31***	0.30***	0.03	0.63***	-0.21***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.06)
Log GDP Per Adult	0.01	0.04***	-0.13***	0.15***	-0.06***	0.22***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	1959	1959	1959	1959	1959	1959
Adjusted R2	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***	0.25***	0.11***	0.16***	0.28***	0.25***
	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.06)
Log GDP Per Adult	0.09***	0.07***	-0.03***	0.08***	0.12***	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
N	1959	1959	1959	1959	1959	1959
Adjusted R2	0.89	0.85	0.90	0.91	0.89	0.91

Notes. This table repeats Table A7 but without weighting countries by population size.

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

	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
A. Before Controls						
$\log 1-\tau(L)$	0.71***	0.43***	0.55***	-0.12	0.51***	0.379*
	(0.10)	(0.09)	(0.06)	(0.10)	(0.07)	(0.226)
B. Controlling for Social Spending						
$\log 1-\tau(L)$	0.64***	0.38***	0.39***	-0.01	0.43***	0.313
	(0.11)	(0.09)	(0.06)	(0.10)	(0.08)	(0.206)
Social Spending	-0.006	-0.005	-0.014***	0.010*	-0.007	-0.006
	(0.006)	(0.005)	(0.004)	(0.005)	(0.005)	(0.010)
C. Controlling for Regulations						
$\log 1-\tau(L)$	0.31**	0.20	0.37***	-0.17	0.15*	0.037
	(0.14)	(0.12)	(0.08)	(0.14)	(0.09)	(0.343)
Formal Employment	-0.39***	-0.22**	-0.09*	-0.12	-0.31***	-0.335
	(0.11)	(0.11)	(0.05)	(0.11)	(0.08)	(0.333)
Labor Regulations Index	-0.05	-0.05	-0.12***	0.08	-0.09*	-0.054
	(0.08)	(0.07)	(0.05)	(0.07)	(0.05)	(0.213)
D. Controlling for Social Spending and Regulations						
$\log 1-\tau(L)$	0.31**	0.18	0.27***	-0.08	0.13	0.025
	(0.14)	(0.12)	(0.08)	(0.14)	(0.09)	(0.345)
Social Spending	-0.000	-0.002	-0.012***	0.011**	-0.002	-0.002
	(0.006)	(0.005)	(0.004)	(0.005)	(0.005)	(0.009)
Formal Employment	-0.39***	-0.22**	-0.06	-0.15	-0.31***	-0.331
	(0.12)	(0.11)	(0.05)	(0.12)	(0.08)	(0.335)
Labor Regulations Index	-0.05	-0.05	-0.11**	0.07	-0.09	-0.05
	(0.08)	(0.07)	(0.05)	(0.07)	(0.05)	(0.215)
N	126	126	126	126	126	126
Adjusted R-Squared	0.41	0.20	0.52	0.26	0.39	0.33

Notes. This table repeats 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)

	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
A. Before Controls						
$\log 1-\tau(L)$	0.63***	0.37***	0.55***	-0.17	0.53***	0.027
	(0.12)	(0.11)	(0.08)	(0.12)	(0.10)	(0.197)
B. Controlling for Social and Pension Spending						
$\log 1-\tau(L)$	0.47**	0.40**	0.49***	-0.08	0.55***	0.026
	(0.18)	(0.17)	(0.11)	(0.17)	(0.16)	(0.298)
Social Spending	0.001	-0.001	-0.015***	0.014*	-0.006	0.010
	(0.009)	(0.008)	(0.006)	(0.008)	(0.008)	(0.015)
Pension Spending	-0.01*	-0.01	0.01**	-0.02**	0.00	-0.021*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.011)
C. Controlling for Social and Pension Spending and Regulations						
$\log 1-\tau(L)$	0.23	0.21	0.36***	-0.14	0.25	-0.022
	(0.20)	(0.18)	(0.12)	(0.19)	(0.16)	(0.342)
Social Spending	0.001	-0.000	-0.014***	0.014*	-0.005	0.010
	(0.008)	(0.008)	(0.005)	(0.008)	(0.007)	(0.015)
Pension Spending	-0.01*	-0.01	0.01***	-0.02***	0.00	-0.021*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.011)
Formal Employment	-0.49***	-0.38***	-0.04	-0.35***	-0.55***	-0.165
	(0.13)	(0.12)	(0.08)	(0.12)	(0.10)	(0.224)
Labor Regulations Index	-0.00	-0.01	-0.14***	0.13*	-0.04	0.040
	(0.08)	(0.08)	(0.05)	(0.08)	(0.07)	(0.142)
N	99	99	99	99	99	99
Adjusted R-Squared	0.55	0.31	0.64	0.38	0.52	0.43

Notes. This table reproduces table A8 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
Before Controls			
$\log 1-\tau(L)$	0.428***	0.796***	0.364***
	(0.089)	(0.282)	(0.079)
Controlling for Social Spending and Regulations			
$\log 1-\tau(L)$	0.182	-0.439	0.212*
	(0.120)	(0.481)	(0.107)
Social Spending	-0.002	0.041	-0.004
	(0.005)	(0.032)	(0.004)
Formal Employment	-0.215**	-1.174***	0.121
	(0.107)	(0.360)	(0.091)
Labor Regulations Index	-0.045	-0.052	-0.246**
	(0.071)	(0.102)	(0.094)
N	126	57	69
Adjusted R-Squared	0.20	0.32	0.29

Notes. This Table reproduces Table A9 but without weighting countries by population size.

Appendix C. Additional Methodological Details

How questions on hours worked are asked across surveys potentially affects the comparability of our estimates. We discuss six 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 is the case of 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 proxying 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.[22]

[22] 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. This is especially the case 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, 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. Finally, 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.

References

Abraham, K. G., A. Amaya. 2019. "Probing for Informal Work Activity." *NBER Working Paper 24880*, 2019.

Abraham, R., N. Anjum, R. Lahoti, H. Swaminathan. 2024. "What Did They Say? Respondent Identity, Question Framing, and the Measurement of Employment." *WIDER Working Paper, No. 2024/64*, 2024.

Ambler, K., S. Herskowitz , M. K. Maredia. 2026. "Rural Labor Supply and Recall Window Sensitivity." *World Bank Economic Review*, 2026.

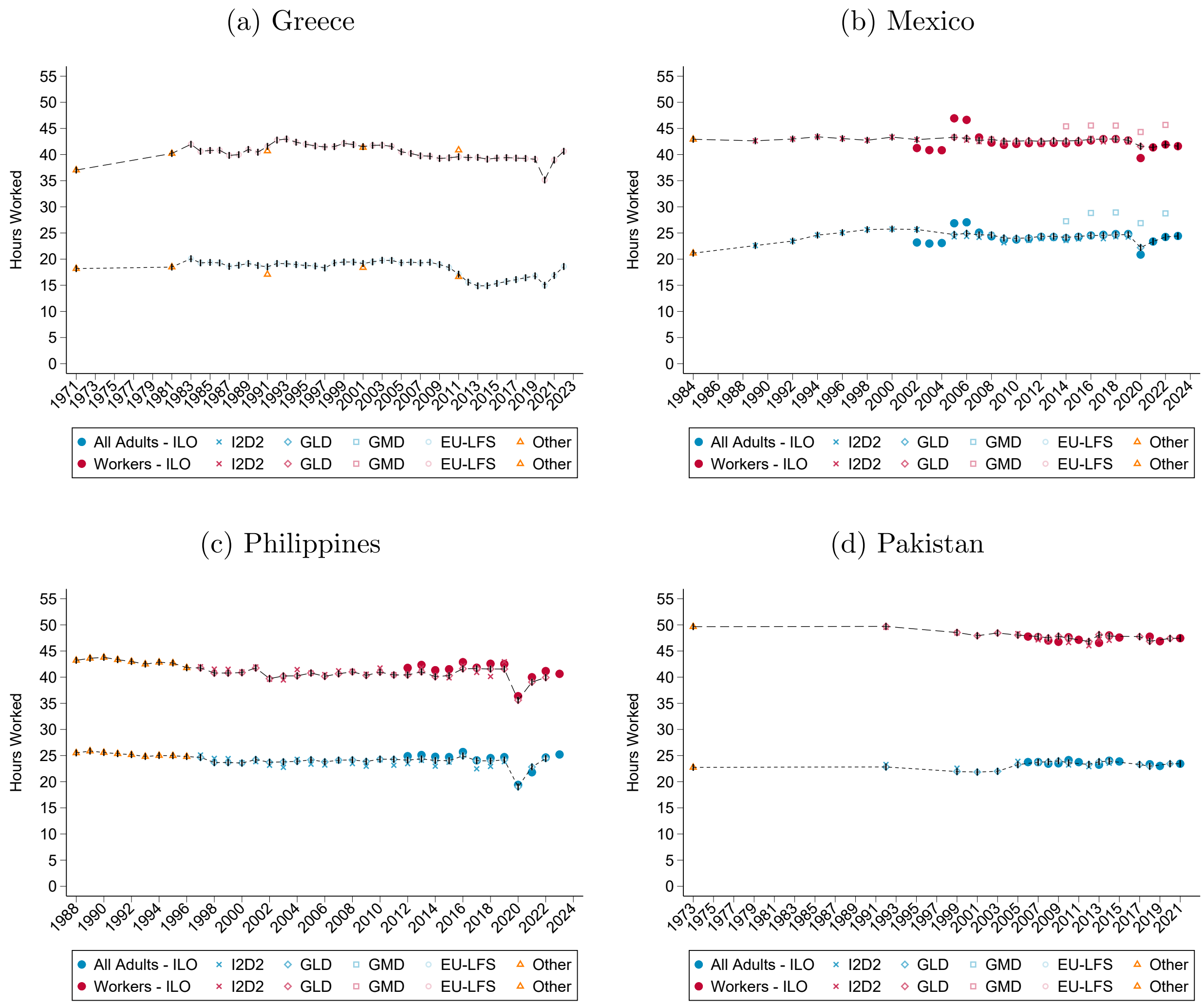
Bardasi, E., K. Beegle, A. Dillon, P. Serneels. 2011. "Do Labor Statistics Depend on How and to Whom the Questions Are Asked? Results from a Survey Experiment in Tanzania." *World Bank Economic Review* 25(3), 2011, 418–447.

Gaddis, I., G. Oseni, A. Palacios-Lopez, J. Pieters. "Measuring Farm Labor: Survey Experimental Evidence from Ghana." *World Bank Economic Review* 35(3), 2021, 604–634.

Heath, R., G. Mansuri, B. Rijkers, W. Seitz, D. Sharma. "Measuring Employment: Experimental Evidence from Urban Ghana." *World Bank Economic Review* 35(3), 2021, 635–651.

Lee, J.-W., H. Lee. "Human capital in the long run." *Journal of Development Economics* 122(1), 2016, 147-169.

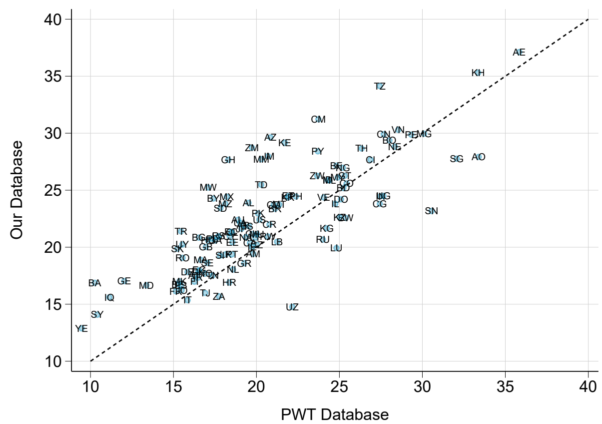
Figure C1: Data Harmonization Examples



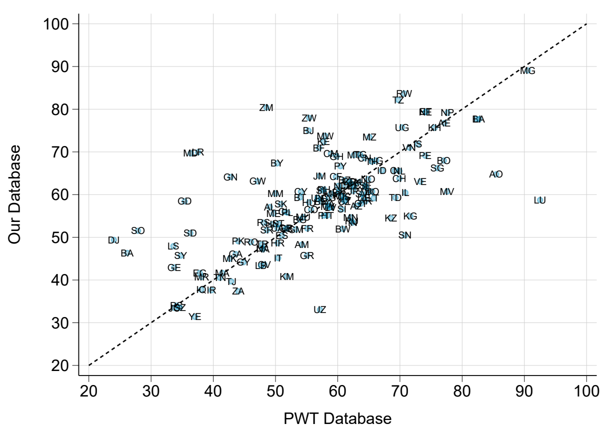
Notes: This figure plots the evolution of hours per adult (blue) and hours per worker (red) by data source in Greece, Mexico, the Philippines, and Pakistan, together with the selected series that are used in the final database (black dashed lines). I2D2: World Bank I2D2 survey microdatabase. GMD: World 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

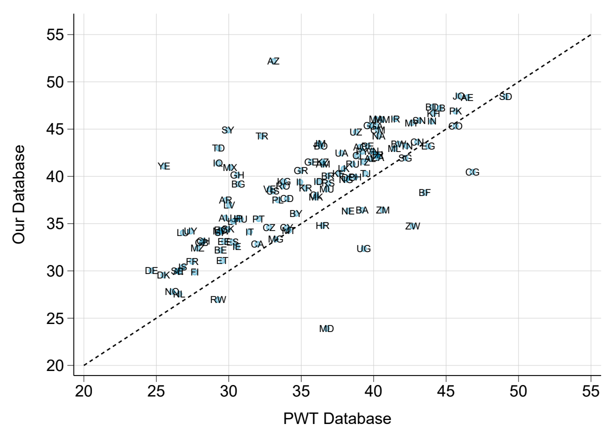
(a) Hours per Adult



(b) Employment Rate



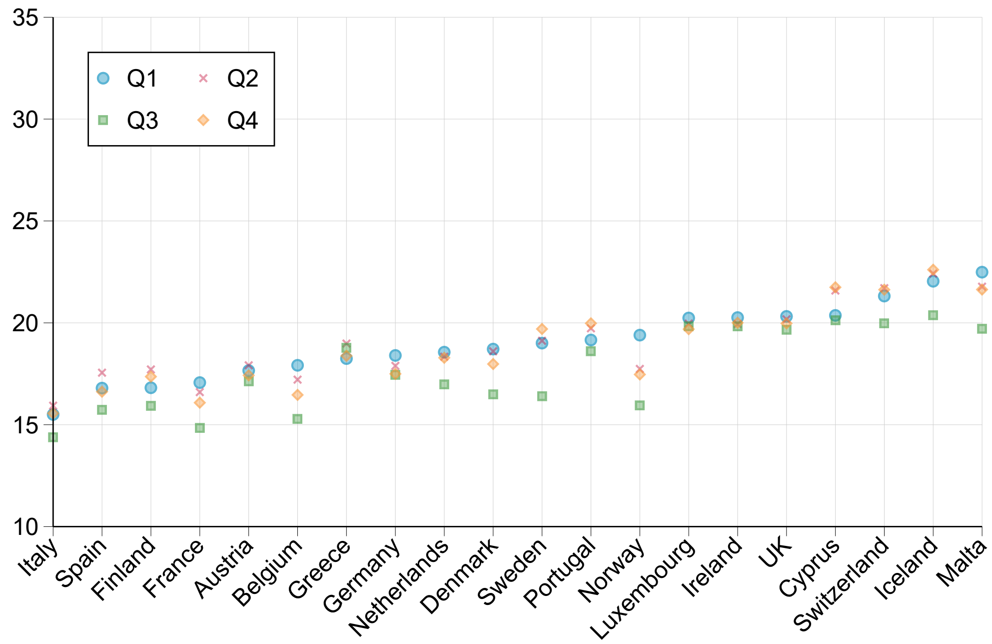
(c) Hours per Worker



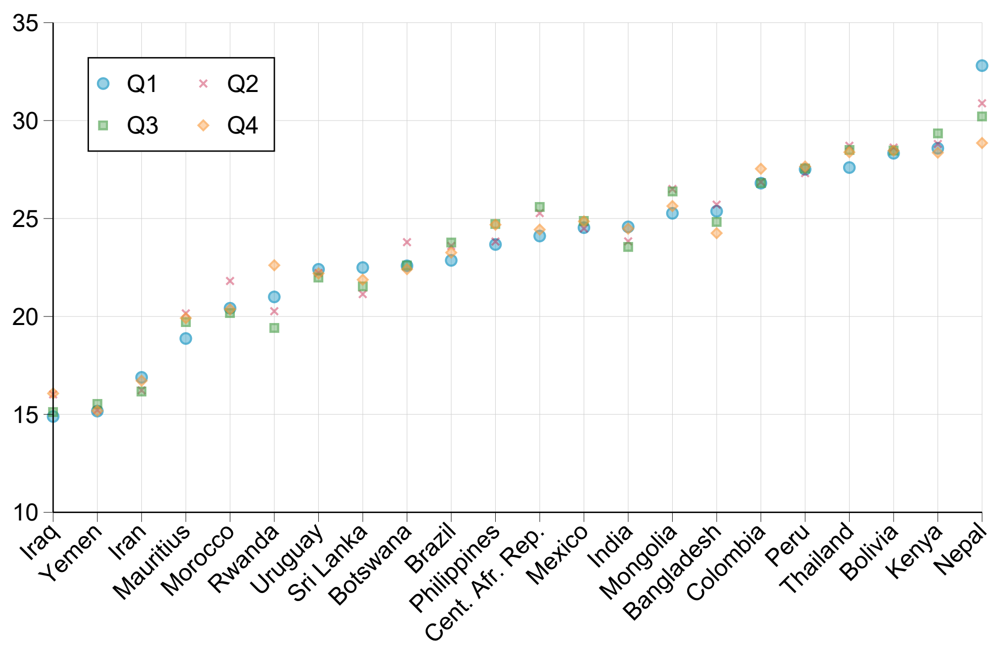
Notes: This figure compares estimates of weekly hours worked per adult (panel (a)), the employment rate (panel (b)), and hours per worker (panel (c)) in our database and in the Penn World Tables (sourced from the Conference Board Total Economy database). Estimates of hours per adult are calculated by 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.

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

(a) Western Europe



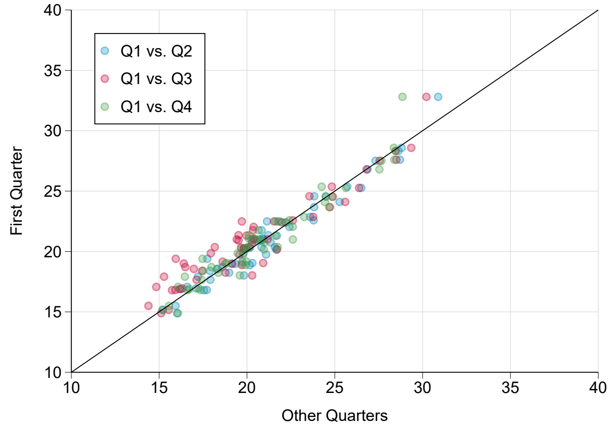
(b) Developing Countries



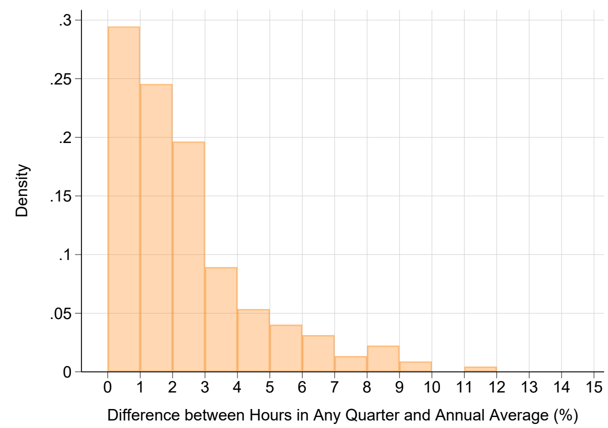
Notes: The figure depicts average hours of work per adult (aged 15+) by quarter in Western Europe (panel (a)) and developing countries (panel (b)), based on labor force surveys fielded over the entire year. Hours worked in Western Europe are generally lower in the third quarter, corresponding to the 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

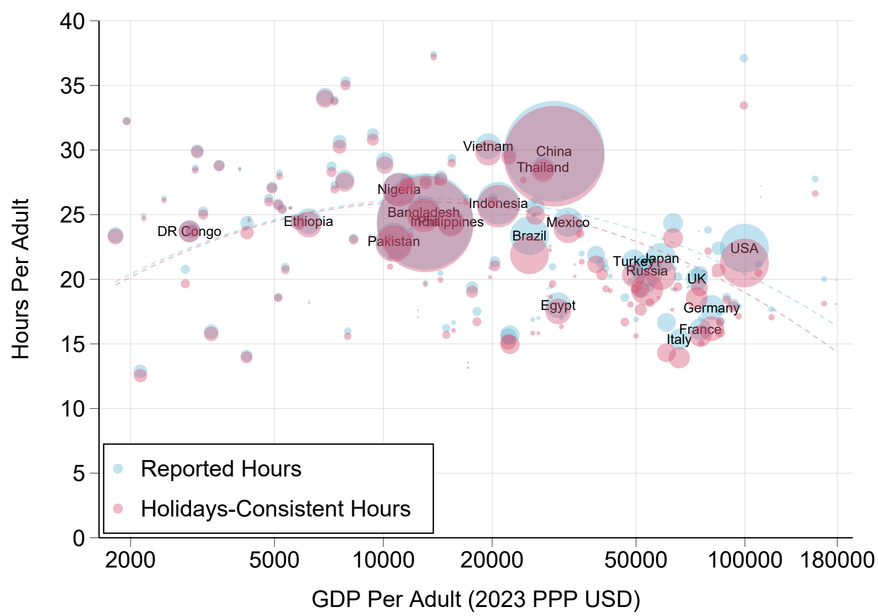
(a) Hours per Adult by Quarter



(b) Distribution of Quarterly Deviations in Hours



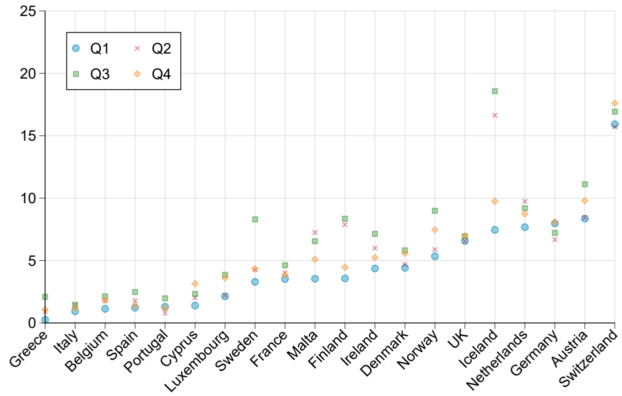
(c) Observed vs. Holidays-Consistent Hours Worked and Development



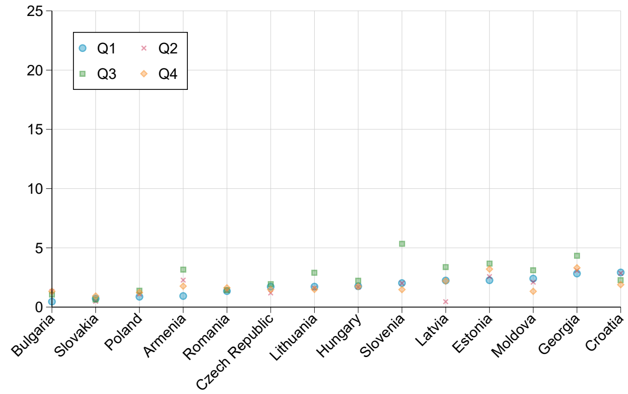
Notes: Panels (a) and (b) compare hours per adult observed across quarters, based on 224 nationally representative surveys that were fielded in 56 countries throughout the year and provide information on the quarter of interview. Panel (a) compares hours per adult aged 15+ in the first quarter versus 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: $h_{adj} = (1/52.14) \times \left[\left(\text{formal} \times e \times h \times (52.14 - \frac{\text{leave}}{5})\right) + \left((1 - \text{formal}) \times e \times h \times 52.14\right)\right]$ 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: Young (15-19)

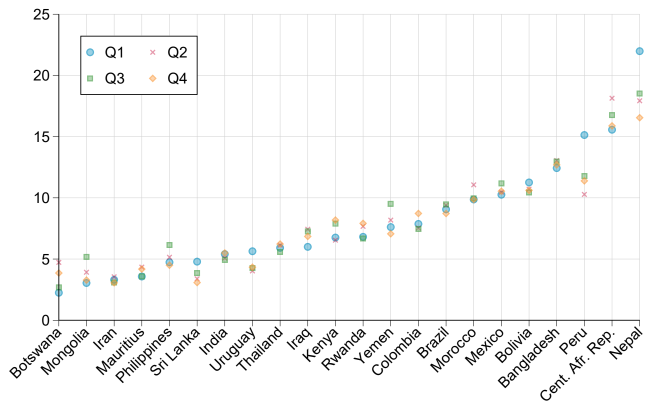
(a) Western Europe



(b) Eastern Europe



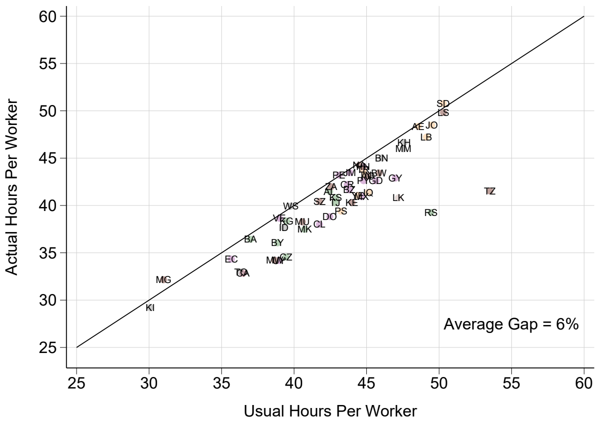
(c) Developing Countries



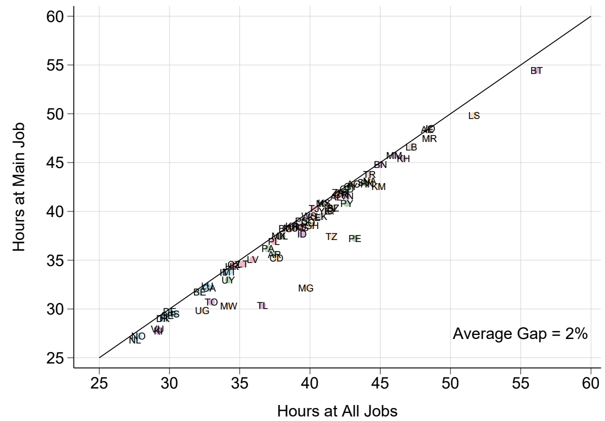
Notes: This figure reproduces Figure C3 but focuses on seasonal variations in hours worked by the young aged 15-19. There are significant increases in young hours of work in many Western European and Eastern European countries during the third quarter of the year. Seasonal fluctuations in hours worked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

Figure C6: Hours Worked by Measurement Concept

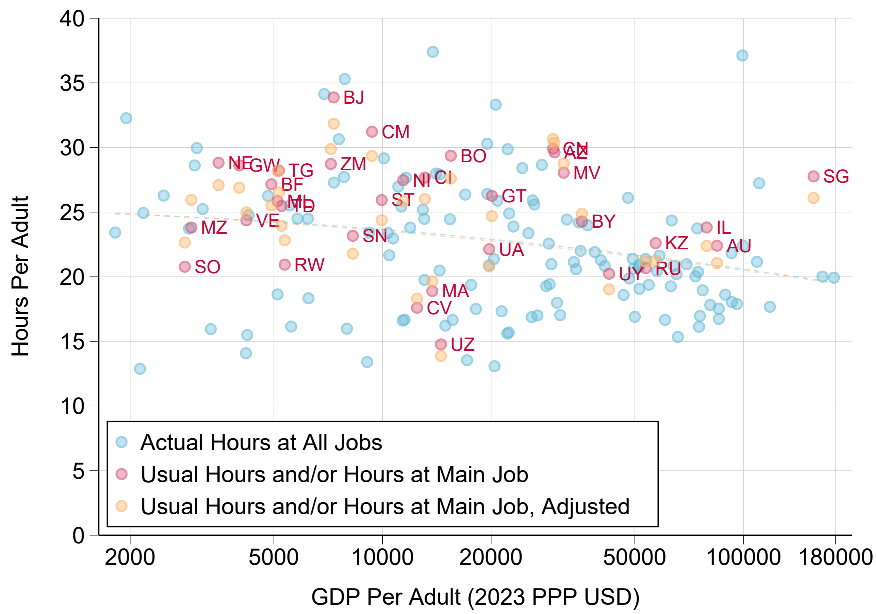
(a) Actual vs. Usual Hours Worked



(b) Hours Worked at Main Job vs. at All Jobs



(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 actual and usual average 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 Labor 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 Millńaire pour le Dv́eloppement, 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 is the most recent available year (excluding COVID years 2020-2021) and the one 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 ILCS 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 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 ε^c is the compensated (Hicksian) elasticity of hours of work with respect to $\bar{w}$. The compensated elasticity captures substitution effects.[23] Theoretically, $\varepsilon^c \geq 0$, $\eta \leq 0$, and ε^u is not signed (but less than ε^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 ε^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 λ 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

[23] 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:

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

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

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:

ε_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 ε_w smaller than ε_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 ε^u and η as a function of the reduced form elasticities as follows:

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

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

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 $\varepsilon_w << \varepsilon_{1-\tau_L}$ 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 ε_w is consistent with a positive uncompensated elasticity ε^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 $\varepsilon^u = 0.2$.