Global Working Hours

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August 29, 2025

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 are slightly bell-shaped with GDP per capita but weakly correlated with development overall. Hours worked by the young (aged 15-19) and elderly (aged 60+) decline with development, driven by growing school attendance and public pension coverage. Hours worked among prime-age adults (aged 20-59) are mildly bell-shaped with development for men while they are increasing for women. The fall in male hours in middle-to-higher income countries is driven by reduced hours per worker and is offset by increases in female labor force participation. These two forces have exactly compensated each other in many countries, leading to a remarkable long-run stability of prime-age hours worked. 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 prime-age hours, 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 this link, suggesting that regulations also play a large role in reducing intensive hours in higher-income countries.

*Gethin: World Bank (email: agethin@worldbank.org); Saez: University of California Berkeley, Department of Economics (email: esaez@berkeley.edu). We thank David Lagakos, Louise Paul-Delvaux, Thomas Piketty, Benjamin Schoefer, and numerous conference and seminar participants for helpful discussions and comments. Clotaire Boyer provided research assistance. We also thank the International Labour Organization for giving us access to data tabulations from their collection of harmonized household surveys; we are especially thankful to David Bescond for his help and assistance throughout. We are also grateful to Mario Gronert for his advice and help in accessing and exploiting the World Bank Global Labor Database, as well as to the World Bank Data Team. Financial support from the Berkeley Stone Center on Inequality and the European Research Council is gratefully acknowledged. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

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 hours of work information, notably China and India, which represent 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. 2022) and government spending (Fisher-Post and Gethin 2023, Gethin 2024). This allows us to explore the links between public

[1]The ILO also shared data for Gethin's (2025) study on education and global poverty reduction and for Fisher-Post and Gethin's (2023) 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) focused primarily 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 seasonality is minimal in most developing countries.[2] This gives us confidence that surveys that do not cover the full year still provide reliable information on annual hours worked.

Finally, we plan to publish and regularly update a publicly available database covering hours worked and other labor market outcomes at the country×year×age×gender×education level, which will allow researchers to replicate 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 is employed. They work an average of 43 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 are mildly bell-shaped with GDP but weakly correlated with development overall. Increasing hours at low

[2]Seasonality is actually larger in richer countries due to summer holidays.

levels of development are driven by structural change: hours per worker in manufacturing and services are strongly bell-shaped with development and very high in middle-income countries, while hours in agriculture are moderate in level and flat with GDP per capita. Adult employment rates are uncorrelated with development. As a result, the implied unconditional elasticity of hours worked with respect to GDP is close to zero and statistically insignificant. We confirm this pattern in long time series covering 86 countries: GDP growth is not significantly associated with either increasing or declining working hours.[3]

Third, we document significant heterogeneity in this overall pattern by age and gender. Hours worked by the young (age 15-19) and the elderly (age 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 suggests that developing countries have increased schooling faster but have not developed as generous pension systems as the 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 capita. Female working hours rise with development, while male working hours decline but at a slightly lower pace. 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. In many countries, these opposite dynamics by gender have exactly compensated each other, leading to a remarkable long-run stability of hours worked among prime-age adults.

Fourth, we explore the link between prime-age hours of work and public policies: taxes on

[3]Bick, Fuchs-Schündeln, and Lagakos (2018) found a markedly decreasing pattern of hours of work with development in cross section. The main reason is that they did not cover as many low- and middle-income countries as we do, especially some countries with very low working hours such as Iran, Somalia, and Sudan.

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 economic growth increases the wage rate (uncompensated labor supply effects) while labor taxes fund transfers (compensated labor supply effects), the traditional explanation in the macroeconomics literature is that this reveals substitution effects created by income effects. We do find that controlling for social spending (cash or quasi-cash transfers but excluding pensions) attenuates the labor tax effects, consistent with this explanation. However, this attenuation is only partial. In contrast, we find that controlling for the share of formal workers and working hours regulations drastically reduces the link between labor taxes and hours leaving a small elasticity of hours worked with respect to net-of-tax rates around 0-0.3, in line with existing micro studies. This suggests that labor taxes depress hours worked not mainly through income and substitution effects but rather because they correlate with the development of formal work and the substantial regulations of working hours that come with it. This might be the key factor driving down long hours among workers at the highest 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. Earlier cross-country work had mostly focused on richer countries (see for example Bick, Bruggemann, and Fuchs-Schündeln 2019) with a large body of work analyzing

how taxes, retirement systems, regulations, or social norms can explain their differences.[4] The gender division of work has also received considerable attention (e.g., Bick, Fuchs-Schündeln, and Lagakos 2018; Bick et al. 2022; Gottlieb et al. 2024). Our new database allows us to considerably expand the scope of the analysis, as well as to reevaluate the roles of economic, cultural, and institutional factors in shaping working hours over the course of development.

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. The historical gender gap in hours worked has also been studied extensively especially in the United States (e.g., Goldin 1990, 1995, 2024; Ngai, Olivetti, and Petrongolo 2024).[5] For more recent decades, work on the determinants of hours worked in time series has primarily focused on richer countries and the role of taxes (e.g., McGrattan and Rogerson 2004; Ohanian, Raffo, and Rogerson 2008). Our new database allows us to study long-run trends in hours worked and their determinants in 86 countries at all levels of development.

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.

[4]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 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.

[5]See also Chiplunkar and Kleineberg (2025), who analyze gender employment patterns in 90 countries over the past five decades. Dinkelman and Ngai (2022) focus on female labor force participation in Africa in recent decades.

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 4,700 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.[6] 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

[6]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. About 850 of these surveys contain a detailed labor module, however, 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.

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 brings together 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 130 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 for the poorest countries. We systematically remove from our database surveys fielded in low-income countries that rely solely on this new definition, ensuring that our statistics on hours worked do cover unpaid agricultural work in countries with large agricultural sectors.[7]

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.

As an illustration, Appendix Figure A.1 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 consistent series that we have selected from those sources.

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. It excludes hours spent on activities that are not recorded as output in the national accounts, namely service work that is not paid such as cooking, cleaning, or childcare and elderly care within the household.

The vast majority of surveys in our database ask all household members aged 15 or above about actual hours worked in the past week. In a handful of cases where this information is not

[7]Thankfully, a number of surveys collect both definitions of hours of work. However, this change in definition is a serious issue we want to flag for future comparative work on labor supply in less developed countries.

available, we rely on usual weekly hours worked.[8]

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 A.2 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, 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. 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 ILO.[9]

The microdata cover a total of over 480 million individuals surveyed in 160 countries (see Appendix Table A.1). 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 2,500 surveys, allowing us to cover both the worldwide distribution of work hours today and high-quality time series spanning several decades in about 86 countries.[10]

Appendix Table A.2 provides further information on the sources used in our final database.

[8] See Appendix Table A.9. In the last survey year available, the data cover actual hours worked in 141 countries out of 160, amounting to 93% of the world's population. 21 countries only report data on usual hours.

[9] By adult population size, 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).

[10] In addition to these long series in 86 countries, our database covers shorter time series in almost all countries.

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 et al. 2018; Bick et al. 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.

Figure 1, Panel (a) plots weekly hours per adult by quarter in a sample of 20 Western European countries. There is clear evidence of seasonality, in line with the existing literature (Bick et al. 2019). Hours worked are much lower in the third quarter, corresponding to the summer holidays. At the same time, this seasonality is limited, in the sense that restricting the analysis to one quarter or another would not lead to major rerankings in terms of which countries have higher work hours than others.

Figure 1, Panel (b) turns to developing countries. Seasonality is substantially lower in this sample of countries. In almost all countries, hours worked differ by less than 2 or 3 hours per

adult across quarters. One should also stress that seasonality is likely to be overestimated in this group of countries, given that some of these surveys were fielded over the entire year but are not meant to be strictly nationally representative in each quarter.

In Appendix Figure A.3, 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%.

We also investigate the implications of downward-adjusting hours worked to make them consistent with legal paid annual leave in each country, following Bick et al. (2019). This adjustment slightly reduces estimates of hours worked in rich countries but leaves the broad picture unchanged (see Appendix Figure A.3, panel c).[11] 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

3.1. Global Statistics on Hours Worked

Table 1 reports global weekly hours worked statistics by gender and broad age groups for all adults (aged 15+) in our data representing 97% of the world population for the most recent year (generally 2022-2023 or 2019; we exclude the years 2020-2021, which are affected by COVID).[12]

Worldwide, adults aged 15 and above work 24.5 hours per week on average on jobs con-

[11] We construct holidays-consistent hours as follows. For Europe and the United States, we correct our series using data from Bick et al. (2019), who adjust hours reported in survey data using information on holidays from external sources. For other countries, we estimate adjusted hours as:

$$h_{adj} = \frac{\left(\text{formal} \times e \times h \times (52.14 - \frac{\text{leave}}{5})\right) + \left((1 - \text{formal}) \times e \times h \times 52.14\right)}{52.14}$$

with *formal* the share of formal employment, e the employment rate, h weekly hours per worker, and *leave* 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.

[12] Appendix Table A.9 shows the year used for each country.

tributing to GDP. Men work 31.7 hours and women 17.2 hours on average. Hence, women's hours worked are only 54% of men's hours worked: they provide 35% of global hours worked while men provide 65%.[13] Most of this gender gap is explained by the extensive employment margin as only 47% of women are employed compared to 71% of men, so that the female employment rate is 66% of the male employment rate. Conditional on employment, women work 38 hours, which is 85% 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 7.4 hours per week on average because only 22% of them are employed. Symmetrically, the elderly work only 11 hours because only 33% of them are employed. Prime-age adults, defined as those aged 20 to 59, work on average 43.5 hours conditional on being employed and 72% of them are employed, so that hours per prime-age adult are 30.6 on average. Conditional on being employed, both the young and elderly work 38 hours, almost as much as the prime-age.

Figure 2 depicts global average weekly hours worked per adult (aged 15 and above) in panel (a), employment rates per adult in panel (b), and 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+.[14] As is well known, 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

[13] We also find that women earn about 35% of global labor earnings at purchasing power parity, consistent with the recent results of Neef and Robilliard (2021) also reported in the World Inequality Report 2022 (Chancel et al. 2022, Figure 12). This does not mean that there is no gender gap in wages within each country, however (see Andreescu, Loubes, Piketty, and Robilliard 2025). As we shall see, women work more than 35% of hours in richer countries and richer countries contribute disproportionally more to global earnings. This compositional effect counterbalances the wage gender gap within countries, which explains why women both work 35% of global market hours and earn about 35% of global earnings. Recall that our measure of hours worked excludes unpaid family labor services (such as childcare, cooking, cleaning, etc.) as they are not included in GDP. See Andreescu, Loubes, Piketty, and Robilliard 2025 for statistics including both paid and unpaid work by gender across the world and over time.

[14] This bell-shaped pattern of hours of work with age has been presented in previous work notably by Blundell, Bozio, and Laroque (2013) for the US, UK, and France and Bick et al. (2018) for their core sample of 49 countries.

employment rates peak at about 65%.[15] 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.

3.2. Hours Worked by Country Income Group

Next, we examine in Figure 3 hours worked by stage of development using the World Bank grouping of countries (as of 2023) in four groups: low-income, lower-middle-income, upper-middle-income, and high-income.[16] Estimates are always weighted by adult population size in each country to be representative of the 97% of the world adult population covered by our data.

Panel (a) depicts hours of work per adult for all adults (black bars), men (blue bars), and women (pink bars). Panel (a) shows that hours of work first increase modestly from 23 in low-income countries to 26 in upper-middle income countries, and then decrease sharply to reach 20 hours per adult in high-income countries. Interestingly, men's working hours peak earlier, in lower-middle-income countries, while women's hours peak in upper-middle income countries. Hours worked among men decline very substantially from 35 hours in lower-middle-income countries to 24 hours in high-income countries.[17]

Panel (b) depicts hours of work per adult using our broad age groups: young (aged 15-19), prime-age (age 20-59), and elderly (age 60+). The width of each bar is proportional to its population size to illustrate the quantitative importance of population aging with development status. For the prime-age, hours worked increase and then decrease with economic development as in panel (a). In contrast, hours of work among the young and especially the elderly decrease with economic development. Both the young and the elderly work more than twice longer in low-income countries relative to high-income countries. Interestingly, the reduction in hours for the

[15] The sharper decline in employment for women in their 50s relative to men is largely driven by China and its early retirement policy for women.

[16] The classification can be found online at https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html.

[17] Appendix Figure A.5 decomposes hours of work by gender and stage of development into the employment rate and hours per worker margins. Employment rates for women first decrease and then increase with development, while employment rates for men decline slightly with development. Hours per worker are bell shaped with development for both men and women.

young happens "earlier" (lower-middle-income) than for the elderly (upper-middle-income).[18]

Panel (c) depicts hours per worker by industry and stage of development. Again, the width of each bar is proportional to the corresponding size of the workforce to illustrate shifts across industrial sectors over the course of development. Panel (c) shows that hours per worker first increase slightly and then decrease sharply in all sectors except in agriculture where they increase slightly even for richer countries. Except for high-income countries, hours in agriculture are substantially lower than in other sectors. Because the share of agriculture is so large in poorer countries and declines so dramatically, this contributes to the increase in hours in the early stage of development.

4. Cross-Country Variations in Hours Worked

It is useful to further disaggregate the data by country following the pioneering study by Bick, Fuchs-Schündeln, and Lagakos (2018). Relative to their study, we always consider population weighted estimates so as to be representative of the full world population. We provide unweighted analyses and a reconciliation with Bick, Fuchs-Schündeln, and Lagakos (2018) in the appendix (see below). 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 A.2) 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 also depict the best quadratic fit (weighted by adult population), which is useful to uncover non-monotonic patterns across countries.

[18] Appendix Figure A.6 decomposes hours of work by age groups and stages of development into the employment rate and hours per worker margins. The employment rate of prime-age workers increases with development while it falls for the young and elderly. Hours per worker are bell-shaped with development for all groups and fall dramatically for the young in high-income countries where the young more often combine schooling with part-time work. The elderly in lower income countries tend to be younger on average than in richer countries. Appendix Figure A.11, Panel (a) shows that controlling for the age composition of the elderly within countries does not change the overall pattern.

4.1. Hours Worked Over the Course of Development

Figure 4 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. Panel (a) shows that hours worked are bell-shaped with development, consistent with our analysis in Figure 3a. This cross-sectional figure also illustrates the wide heterogeneity in hours worked even conditioning on economic development. Hours per adult in some Sub-Saharan African countries such as Madagascar and Tanzania are almost twice as high as comparably poor countries such as Afghanistan or Sudan. As we show in Appendix Figure A.4, Bick, Fuchs-Schündeln, and Lagakos (2018) find a declining pattern of hours of work with development because their data are less complete at the middle and low ends of the development spectrum. Weighting by population—which we do and they don't—further accentuates the initial rise in hours with GDP per capita. Table 2, Panel A summarizes our cross-country findings. The first column shows no statistically significant correlation between hours of work and log GDP per adult in our full (weighted) sample.

Panel (b) of Figure 4 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 over 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 5 depicts the standard deviation in 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 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.

4.2. Industry

As the bell shape of hours with development is driven primarily by the intensive margin, it is useful to look at hours of work per worker by broad industrial categories. Figure 6 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 clear 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 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 A.7 for the fraction of workers in each sector across countries). With development, the share of workers in manufacturing and private services grow and these sectors tend to have substantially longer hours than agricultural work. This creates the rising pattern at very 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.[19]

4.3. Age

As we discussed earlier, the young and elderly work substantially less than the prime-age. Figure 7 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 in 2023 PPP USD.[20]

Panel (a) shows that prime-age hours of work are weakly bell-shaped with development consistent with our previous analysis. Lower hours among very poor countries are mostly driven by Asian, Middle-Eastern, and Sahelian countries such as Afghanistan, Sudan, and Yemen depicted in brown on the figure. Very poor Sub-Saharan African countries tend to have higher hours. Table 2, Panel A shows no correlation between hours of work per prime-age adult and log GDP per adult (col. 2).

Panel (b) shows a notable decline of hours of work of the young with development. Panel (c) shows an even stronger decline of hours of work of the elderly. Table 2, Panel A cols. 5 and 6 shows the quantitative magnitudes. It is again important to note the great heterogeneity across countries particularly among the young and the elderly. The elderly and the young work

[19]This pattern is also consistent with Bick, Blandin, and Rogerson'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.

[20]The decomposition in employment rates and hours per worker is provided in Appendix Figures A.8, A.9, and A.10.

long hours in many Sub-Saharan African countries but little in several poor Muslim countries such as Sudan or Yemen.[21]

Schooling and Hours of Work of the Young. Educational attainment increases with development (e.g., Gethin 2025), implying that young workers (15-19) are more likely to attend school in richer countries and hence have less time available for work. Figure 8 panel (a) plots school attendance against hours of work of the young (age 15-19) across countries.[22] 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 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 150 countries for which the determinants we consider are available. It covers 92% of the world adult population. Hours worked by the young are negatively correlated with log GDP per adult (column 1). School attendance of the young is the main determinant for their hours worked (cols. 2-4). Increasing school attendance by 1 percentage point decreases hours of work by 0.25-0.30 hours (with an unconditional mean of 7.1 hours worldwide). Just including this variable explains over 60% of the variation across countries (Adjusted $R^2 = .63$ in col. 2), which is much higher than the Adjusted $R^2 = .17$ when including only GDP. When including school attendance, the coefficient on log GDP per adult becomes slightly positive (col. 3). Finally, col. 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.

[21] Appendix Figure A.11b 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.

[22] School attendance is reported in the labor force surveys, so we construct these measures directly from the microdata. Notice that the relationship between school attendance and hours worked is not mechanical, as young adults may be both attending school and working or doing neither.

With sectoral composition and school attendance variables, hours of the young are strongly positively related to GDP per adult (col. 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).

Pensions and Hours of Work of the Elderly. Panel (b) of Figure 8 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 pension) and hours of work of the elderly (aged 60+).[23] The figure shows a strong negative correlation between pension coverage and hours of work of the elderly across countries consistent with a key role of pensions in reducing hours of work of the elderly. Poor countries in Sub-Saharan Africa have minimal pension coverage and high hours of work among the elderly. Western European countries as well as China and Russia have high pension coverage and low hours of work among the elderly.

To explore the determinants of elderly hours across countries, Table 4 reports results from cross-country regressions of average hours of work of adults aged 60 and above on various determinants. Estimates are weighted by adult population size. The sample includes 92 countries for which the determinants we consider are available. It covers 80% 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 very similar to the regression in Table 2, column 6 for our complete sample of 160 countries. Column 2 shows that pension spending as a fraction of GDP and the size of the elderly population are also negatively related to elderly work. However, pension coverage is even more strongly negatively correlated with hours worked by the elderly (cols. 3-5) and fully explains the negative relationship with GDP (col. 4). 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 general

[23] We construct this measure of pension coverage by combining data from four sources: the World Bank's ASPIRE database for developing countries, the EU statistics on income and living conditions for European Union countries, the CPS for the United States, and the IHDS survey for India. Unfortunately, most ASPIRE surveys only report pension receipt at the household level, which is why we cannot construct a measure of pension coverage at the individual level.

pension systems are created by the government. 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, such pension development is not an inevitable consequence of economic development.

As a caveat, let us to note that our analysis is correlational and does not necessarily imply causality. It also does not capture all the complexities of pension policies–such as the replacement rate of benefits, early and normal retirement ages, the actuarial adjustments of benefits based on retirement age, etc.–all of which can matter for the impact on elderly work as a very large micro-econometrics literature has shown (see e.g. Gruber and Wise 1999 and Blundell, French, and Tetlow 2017 for classic references). Our findings however are broadly consistent with this large literature that identifies pension policy as a key causal driver of elderly work.

4.4. Gender

Figure 9 depicts average weekly hours of work per adult for prime-age men in panel (a) and prime-age women in panel (b).[24]

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 (see Appendix Figure A.12a) and can be explained by the sectoral evolution by development status (Figure 6).

In panel (b) for women, we 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. 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

[24]The decomposition into employment rates and hours per worker is provided in Appendix Figures A.12 and A.13.

15 hours belong to this category.[25] 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 or Egypt and Iran than in the very low-income countries of Afghanistan and Sudan.[26] 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. Appendix Figure A.14 shows that hours of prime-age women are slightly bell shaped with development when restricting the sample to non-Muslim/Hindu countries, a combination of a strongly bell-shaped pattern of hours per worker and a slightly U-shaped pattern of employment rates with development.

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 135 countries (87% of the world population) for which all variables are available, so that the different columns are directly comparable. As we saw earlier in Table 2, column (4), there is a positive relationship between female prime-age hours and log GDP per adult (col. 1). The Muslim/Hindu population share has a very strong negative relationship with hours of work. Moving from 0% to 100% Muslim/Hindu reduces hours by 12 (relative to a global mean of 22). Being a former communist country is associated with an increase in working hours of 5.5 (col. 2). 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-square associated with including only these three variables is a remarkable 76%. The strong effects of Muslim/Hindu shares and former communist status hardly change when adding controls (cols. 3-4). When combining these three variables with log GDP per adult, the correlation of hours with GDP becomes slightly negative

[25]The only three exceptions are the tiny countries of Kiribati, Samoa, and Swaziland.

[26]Saudi Arabia and Kuwait, which are high-income and Muslim could not be included in our database unfortunately.

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.

Table 2, Panel A shows that hours of work of prime-age men are negatively related to GDP per adult while hours of work of prime-age women are positively related to GDP. These two effects approximately offset each other as a 1 log-point increase in GDP per adult is associated with a 2.3 decrease in prime-age male hours and a 3.2 increase in prime-age female hours.

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.

5.1. Prime-Age Adults

We start with prime-age adults and then turn to the young and the elderly in the next subsections.[27] Figure 10 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).[28] 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 years 2020-21), the next data point to the 2010s, etc. For each decade, we

[27] Appendix Figure A.15 presents hours of work for all adults with a decomposition into employment rates and hours per worker.

[28] The decomposition into employment rates and hours per worker is provided in Appendix Figure A.16 for all prime-age adults, Figure A.17 for prime-age men, and Figure A.18 for prime-age women.

average across all surveys available in each country. We always weight by population size.[29]

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.[30]

Panel (a) in Figure 10 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, col. 2 confirms that there is a very small positive relationship between prime-age hours of work and log GDP when pooling the 2,138 surveys with long time series (at least two decades) and including country fixed effects.[31] This is consistent with the cross-country analysis displayed in Table 2, Panel A.

5.2. Gender

However, this stability of prime-age hours over time masks striking offsetting trends by gender. Figure 10, 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 Figures A.17 and A.18 show that the decrease for men comes from the intensive margin while the increase for women comes from the extensive

[29] When we depict time series for a region, we reweight each survey-country to make sure it puts the same weight on each country in each decade so that the series are compositionally consistent over time.

[30] In contrast, historical series of work hours generally cover only manufacturing or even a specific occupation within manufacturing (see Gilmore 2021 and Andreescu et al. 2025).

[31] In this regression, the U.S. includes only the CPS data since 1962, not the earlier Francis-Ramey series.

margin. This suggests that this process is not solely related to economic development but also reflects broader societal trends.[32] Table 2, Panel B confirms that hours worked among prime-age men are negatively correlated with GDP per adult while hours worked among prime-age women are positively related to development. Quantitatively, these OLS coefficients for men and women are twice as large in the panel data as 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 fast (relative to real GDP per adult) in contemporary developing countries than it did historically in frontier economies.[33] This possibly reflects the widely held view among international organizations that women's economic empowerment is a key element of economic development and should be encouraged.

5.3. Young

Figure 11, 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.[34] 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 5 of Table 2, Panel B confirms the sharp drop of hours of work of the young (-7.8 hours per log-point of GDP per adult), which is four times as large as in the cross section in Panel A. This implies that hours of work of the young are converging down faster within countries than would be expected just based on economic growth measured by real GDP per adult. It is likely 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).

[32]Further analysis within countries (not reported) shows that the increase for female employment rates is driven by women in couples with much less change for single women who generally work substantially more than women in couples.

[33]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 A.13a).

[34]The decomposition in employment rates and hours per worker is provided in Appendix Figure A.19.

5.4. Elderly

Figure 11, panel (b) turns to the evolution of hours worked among the elderly.[35] In contrast to the young, there has been a general stability in elderly hours over time (except for the U.S. long time series, which displays a steep decline over 1900-1960s).

Table 2, Panel B, col. 6 confirms that hours of work of the elderly are not falling with 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 US long-time series depicted; see for instance Blundell, French, and Tetlow 2017). It is likely that developing countries today are not mimicking the very generous pensions that many richer countries developed in the past. As in the case of schooling, it is possible that the experience of richer countries (many of which are now trying to increase elderly hours worked) and the recommendations of international organizations on sustainable government spending have influenced pension policy decisions in developing countries (e.g., Queisser 2000).

The key conclusion is that public policies such as education and pensions, which influence hours worked by the young and elderly, can take different paths over the development process and are not fully determined by GDP per adult.

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 correlated with education 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.

Considerable attention has been put in analyzing the role of taxes in shaping hours worked.

[35] The decomposition in employment rates and hours per worker is provided in Appendix Figure A.20.

As we discussed, the very large variation in real incomes per adult across countries is associated with fairly modest differences in hours worked. In the standard labor supply model, this implies that the uncompensated elasticity of hours worked with respect to the real wage are small. This point has been made many times in the literature (see, e.g., Bick et al. (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 analyses pointed to an almost zero relationship between hours worked and development, 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 (as Prescott 2004 famously noted). With zero uncompensated hours worked effects, substitution effects are equal to minus income effects on hours worked and can be positive and even large. In cross-country and time series regressions, we expect the effect of labor income taxes on working hours to capture substitution effects, i.e., compensated elasticities of hours worked. 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).

We revisit this debate by combining our new database on hours worked with data on labor income tax rates across the world and over time recently compiled by Bachas et al. (2022). Bachas et al. (2022) create macro-level average tax rates on labor income that are fully consistent with national accounts in each country.[36] 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.

[36]Bachas et al. (2022) 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.

6.1. The Role of Labor Taxes

Let us start with some simple graphical illustrative analysis. Combining Bachas et al. (2022) tax data with our country-level data, Figure 12 depicts the correlation between average labor tax rates and unconditional hours of work per adult for prime-age men in panel (a) and prime-age women in panel (b).

Panel (a) shows a strong negative correlation between labor tax rates and hours of work of prime-age men across countries. Countries with high labor tax rates tend to have lower unconditional hours of work per adult. Panel (b) shows that this negative correlation also holds for women if we exclude Muslim/Hindu countries, which have much lower female hours worked as we discussed above. The quadratic fit on panel (b) excludes those countries; the regression analysis below controls for Muslim/Hindu population shares and delivers a strong relationship between labor taxes and female hours worked.

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 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. For women, the drop is similarly quantitatively large when excluding Muslim/Hindu countries, from 25-30 hours in countries with almost no labor taxes down to about 20 hours in countries with large labor taxes.

A regression analysis allows us to do a more systematic correlational analysis while controlling for log GDP per adult and Muslim/Hindu population shares, as well as to explore both cross-country and time variations in taxes and hours worked. Table 6 reports results of regressions of various measures of prime-age hours worked on labor tax rates across countries in panel A and in longitudinal analysis with country fixed effects in panel B. 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 in panel A covers 92% of the world adult population.

Cross-Sectional Evidence. In Table 6 panel A, we find that $\log(1-\tau_L)$ is strongly related to log-measures of hours worked. The estimated elasticity of unconditional hours per prime-age adult with respect to net-of-tax rates on labor income is 0.87. This elasticity is driven primarily by the intensive margin (the coefficient is 0.72 for hours per worker and 0.19 and insignificant for employment rates). The elasticities for both prime-age men and prime-age women are large (0.74 and 1.2), confirming what we saw in Figure 12a. The control for the Muslim/Hindu population share is highly negative and needed to uncover this large elasticity for women as we saw in Figure 12b.

When controlling for labor taxes, the coefficient on log GDP per adult becomes positive and generally significant but small in magnitude, typically below 0.1 except for prime-age women (0.15). As GDP per adult proxies for economic development and hence the average wage in the economy, this suggests that the uncompensated elasticity of hours of work with respect to the wage rate is quantitatively small. The dramatic discrepancy between this modest uncompensated elasticity and the large elasticity we find with respect to the net-of-labor tax rate is consistent with the interpretation that the elasticity with respect to labor taxes captures compensated effects, which can be large if income effects are also large.

Time Series Evidence. We now turn to the time series analysis in Table 6 panel B. We include country fixed effects in each regression, as well as a time trend to capture the secular increase in female hours of work and symmetric decline in male hours of work that we documented earlier. The elasticity of hours per prime-age adult with respect to $\log(1-\tau_L)$ remains positive and significant but much smaller: 0.27 (instead of 0.87 in Panel A). This elasticity arises from the intensive margin (0.41) while the elasticity is negative along the extensive margin (-.14). The elasticity is significant for prime-age men (0.37) but smaller and insignificant for women

(0.17), in contrast with Panel A.[37] The elasticity of hours with respect to GDP per adult is positive and generally significant but small, typically around 0.1, which is similar in magnitude to Panel A.

Therefore, the panel analysis reveals two discrepancies relative to the cross-sectional analysis. First, the elasticity with respect to $\log(1-\tau_L)$ is much smaller. Second, the elasticity for women is insignificant in the time series while it is large and significant in the cross section.

6.2. The Role of Transfers

Using data on government transfers, it is possible to test whether the high labor tax elasticities are driven by income effects created by transfers funded by labor taxes.[38] We draw on the database recently compiled by Gethin and Fisher-Post (2024) and Gethin (2024), who combine various sources to 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.[39] We exclude public pensions from social spending because public pensions target the elderly and not the prime-age group we are focusing on in this section.

Table 7, Panel A repeats the regression from Table 6, Panel A for a slightly smaller sample of 126 countries for which the additional control variables are available.[40] The elasticities are very close to those obtained in Table 6, Panel A.

In panel B, we add social spending as a share of GDP in the regression. The elasticities with respect to net-of-labor taxes become smaller, falling by about half across the board to around

[37] Without controlling for a time trend in the regression, the elasticity of female hours of work with respect to $1-\tau_L$ becomes negative and significant, while the elasticity for prime-age male hours becomes larger, capturing the symmetric evolution of male vs. female hours and the fact that labor taxes tend to increase over time.

[38] Rogerson (2006, 2007) and Rogerson and Wallenius (2009) made the point that the structure of transfers is crucial to understand the macroeconomic effect of taxes and provide empirical analysis along those lines for richer countries.

[39] In addition to income effects, some of these transfers can also create additional substitution effects if they are means-tested (e.g., welfare programs or the US Earned Income Tax Credit) or conditional on unemployment (e.g., unemployment benefits).

[40] We do not provide time series analysis for spending and regulation controls because these variables do not have sufficient longitudinal depth.

0.3-0.6, but generally remain significant. For example, the coefficient for prime-age hours per adult falls from 0.84 (top row) to 0.38. The social protection/GDP 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, education, or pensions). 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.[41] Appendix Figure A.22a plots the relationship between social spending (relative to GDP) and prime-age hours per adult. It shows indeed a negative albeit noisy relationship.

It is worth noting, however, that the labor tax elasticities in Panel B remain substantially above the log GDP elasticities of around .1 that we documented in Table 6, Panel A and which capture the uncompensated elasticity. 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.

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. 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

[41] Quantitatively, as wage earnings are about 60% of GDP and $\tau_L \simeq .3$, the corresponding income effect parameter $\eta = (1-\tau_L)\partial(wl)/\partial R \simeq -.7 \times 2.5 \times .6 \simeq -1$ which is large relative to the micro-literature (where η is generally in the range -.5 to -.1). Theoretically, $\eta = \varepsilon^u - \varepsilon^c$ is the gap between uncompensated and compensated elasticity. Read as the difference between panel B and panel A elasticities, we would have $\eta \simeq -.5$ which also would be in the higher range (in absolute value) of micro-literature estimates. Means-tested or conditional transfers also generate substitution effects conceivably explaining why the social spending coefficients translate into a larger income effect ($\eta = -1$) than the differences in elasticities ($\eta = -.5$).

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.[42] Such regulations generally do not apply to the self-employed (e.g., family farm workers), and are typically enforced primarily on formal workers with much weaker enforcement among informal workers (see, e.g., 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 (obtained from the ILO).[43] 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, for all prime-age adults, moving from a zero formality share (this share is around 10% in the poorest countries) to a 100% formality share (as in richer countries) reduces hours of work per adult by 0.43 log points (about 50%). Going from no regulations to the strictest regulations (as in France) reduces hours of work by 0.18 log points (about 20%). Appendix Figure A.22 visually depicts the correlations between hours and formality (panel (b)) and hours and regulations (panel (c)). These results are consistent with studies in the OECD context showing that regulations are associated with lower working hours.[44] Interestingly, formal employment reduces employment but not hours on the intensive margin while regulations reduce hours along the intensive margin but not employment.

Second, adding these two variables dramatically reduces the labor tax elasticity. The coefficient for prime-age hours per adult falls from 0.84 to only 0.13 and becomes insignificant. This small elasticity is consistent with the uncompensated elasticity of hours with respect to log GDP of 0.08 found in Table 6, Panel A. Across all columns, with regulation and formality

[42] Our main results are robust to including all 12 variables separately in the regressions instead of this index. We also investigated asking ChatGPT to separately construct its own indicator of working hours regulations, drawing on legislative sources and complementary information it could find online. We obtained similar results when using the ChatGPT alternative index.

[43] Appendix Figures A.21(a-b) and A.22(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.

[44] Causa (2008) provides an analysis for OECD countries and a review of this literature. Batut, Garnero, and Tondini (2023) analyze five large recent reforms in European countries and also find a negative impact on intensive hours of work.

controls, the elasticity becomes small and generally insignificant. All in all, once controlling for regulations and formality, our estimates imply a fairly modest elasticity of hours with respect to net-of-tax rates on labor income of about 0-0.25, in line with the large micro-level literature on hours and taxes. Comparing with Panel B, we can see that regulations and formality reduce the elasticity much more than the government social spending variable. 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 protection spending and regulations/formality (the coefficients on the control variables are very similar to those in Panels B and C and omitted for the sake of space). In this case, the elasticity of hours with respect to the net-of-labor tax rate vanishes entirely. All coefficients are insignificant and below 0.15.

7. Conclusion

This paper gathered the widest 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 cannot fully explain the negative correlation between labor taxes and working hours. In contrast, 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.

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Table 1: Global Hours Worked

		By Gender		By Age		
	All	Men	Women	Young	Prime-Age	Elderly
Hours per Adult	24.5	31.7	17.2	7.4	30.6	11.0
Hours per Worker	42.8	45.2	38.2	37.5	43.5	37.9
Employment	58.7%	70.7%	47.0%	21.6%	71.7%	32.6%

Notes. This table reports global weekly hours worked statistics by gender and broad age groups for all adults (aged 15+). For each country with data (see Figure A.2), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). 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: Hours of Work and log GDP per Adult

Panel A: Cross Section

	(1) All Adults	(2) Prime-Age Adults	(3) Prime-Age Men	(4) Prime-Age Women	(5) Young 15-19	(6) Elderly 60+
Log GDP Per Adult	-0.875	0.631	-2.256**	3.189***	-1.849***	-4.137***
	(0.580)	(0.660)	(0.991)	(1.208)	(0.592)	(0.806)
Mean DepVar	22.7	28.4	35.0	22.2	7.2	12.4
Rich-Poor Gap	-3.5	2.5	-9.0	12.8	-7.4	-16.5
N	160	160	160	160	159	160
Adjusted R2	0.03	0.01	0.12	0.11	0.17	0.36

Panel B: Panel Data

	(1) All Adults	(2) Prime-Age Adults	(3) Prime-Age Men	(4) Prime-Age Women	(5) Young 15-19	(6) Elderly 60+
Log GDP Per Adult	-0.740**	0.816**	-5.315***	6.259***	-7.843***	-0.145
	(0.313)	(0.317)	(0.381)	(0.506)	(0.529)	(0.336)
Mean DepVar	21.4	27.6	34.8	20.6	7.3	8.4
Rich-Poor Gap	-3.0	3.3	-21.3	25.0	-31.4	-0.6
N	2,138	2,138	2,138	2,138	2,115	2,138
Within R2	0.01	0.01	0.23	0.36	0.33	0.00

Notes. This table reports regression results linking hours of work per adult in level and log GDP per adult (semi-elasticities) 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+. Prime-age = age 20-59. Panel A includes 97% of the world population from 160 countries using the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). Regressions are weighted by adult population size in each country to be representative. 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. Rich-poor gap: coefficient on log GDP multiplied by four, corresponding to the total effect of moving from the GDP per adult of Somalia to that of Singapore. In both the cross-section and the panel analysis, there is no strong link between log GDP and hours per adult or hours per prime-age adult. Hours of work of prime-age men are negatively related to GDP per adult while hours of work of prime-age women are positively related to GDP per adult. The two effects offset each other. 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. Unweighted regressions are presented in Appendix Table A.3 and display similar results.

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

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-1.844***		0.835**	2.711***
	(0.615)		(0.343)	(0.607)
Young School Attendance		-25.673***	-29.634***	-30.137***
		(2.722)	(3.091)	(3.561)
Employment: Agriculture				9.721***
				(3.695)
Employment: Manufacturing				0.969
				(6.345)
Mean DepVar	7.1	7.1	7.1	7.1
N	150	150	150	150
Adjusted R2	0.17	0.63	0.65	0.71

Notes. This table reports results from cross-country regressions of average hours of work of the young (aged 15-19) in level on various determinants. Regressions are weighted by adult population size in each country to be representative. The sample includes 150 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 of the young is negatively correlated with log GDP per adult (column 1). School attendance among the young is the main determinant of their hours worked (cols. 2-4) and fully explains the negative relationship with GDP (cols. 3-4). Unweighted regressions are presented in Appendix Table A.4 and display similar results.

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

	(1)	(2)	(3)	(4)	(5)
Log GDP Per Adult	-4.955***			1.446	0.509
	(1.220)			(1.688)	(1.199)
Pension Spending		-36.592		-18.079	-34.118*
		(22.385)		(27.441)	(20.254)
Elderly Population Share		-47.363***		-32.824	-15.083
		(17.135)		(19.805)	(13.886)
Pension Coverage			-14.873***	-10.684***	-7.006**
			(2.224)	(3.659)	(2.918)
Employment: Agriculture					0.979
					(6.281)
Employment: Manufacturing					-33.018***
					(7.139)
Mean DepVar	12.0	12.0	12.0	12.0	12.0
N	92	92	92	92	92
Adjusted R2	0.44	0.57	0.64	0.69	0.79

Notes. This table reports results from cross-country regressions of average hours of work of the elderly (aged 60+) in level 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 80% 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 pension. 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 is the main determinant of hours worked among the elderly (cols. 3-5) and fully explains the negative relationship with GDP (col. 4). Unweighted regressions are presented in Appendix Table A.5 and display overall similar results.

Table 5: Hours Worked by Prime-Age Women

	(1)	(2)	(3)	(4)
Log GDP Per Adult	3.565***		-1.203	3.063***
	(1.334)		(0.819)	(0.861)
Muslim/Hindu Share		-12.396***	-13.047***	-12.825***
		(1.605)	(1.511)	(1.680)
Former Communist Country		5.503***	5.304***	7.508***
		(0.868)	(0.922)	(1.448)
% Women Living with Young Children		-0.339	-4.634	-6.725**
		(4.008)	(4.945)	(3.378)
Employment: Agriculture				22.256***
				(4.334)
Employment: Manufacturing				-17.977
				(13.433)
Mean DepVar	21.8	21.8	21.8	21.8
N	135	135	135	135
Adjusted R2	0.13	0.76	0.76	0.85

Notes. This table reports results from cross-country regressions of average hours of work of prime-age women in level on various determinants. Regressions are weighted by adult population size in each country to be representative. The sample covers 135 countries for which all the variables are available. It covers 87% 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 A.6 and display overall similar results.

Table 6: Elasticities of Prime-Age Hours Worked with Respect to Net-of-Labor Tax Rates

A. Cross Section

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
$\log 1-\tau(L)$	0.874***	0.723***	0.194	0.744***	1.195***
	(0.141)	(0.176)	(0.129)	(0.142)	(0.303)
Log GDP Per Adult	0.082***	0.055*	0.031	0.054**	0.145**
	(0.026)	(0.028)	(0.026)	(0.025)	(0.066)
N	138	138	138	138	138
Adjusted R2	0.43	0.38	0.44	0.46	0.62

B. Panel Data

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
$\log 1-\tau(L)$	0.270***	0.414***	-0.145***	0.370***	0.166
	(0.079)	(0.048)	(0.049)	(0.068)	(0.138)
Log GDP Per Adult	0.105***	0.038***	0.067***	0.155***	0.024
	(0.023)	(0.014)	(0.018)	(0.020)	(0.040)
N	1937	1937	1937	1937	1937
Adjusted R2	0.83	0.89	0.89	0.90	0.90

Notes. This table reports results of regressions linking measures of log-hours worked for prime-age adults (across columns) on log net-of-labor tax rate and log GDP per adult across countries in panel A and in panel analysis with country fixed effects in panel B. Estimates can all be interpreted as elasticities of hours worked with respect to net-of-tax rates or GDP per adult. Regressions are weighted by adult population size in each country to be representative. The sample in panel A covers 138 countries and 95% of the world adult population. In Panel A, we include the Muslim/Hindu population share as control (coefficients not displayed) as it strongly affects female hours of work. 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, especially in the cross section. The elasticity of hours with respect to net-of-tax rates on labor income is generally much higher than the elasticity of hours with respect to GDP per adult. Unweighted regressions are presented in Appendix Table A.7 and display overall similar results.

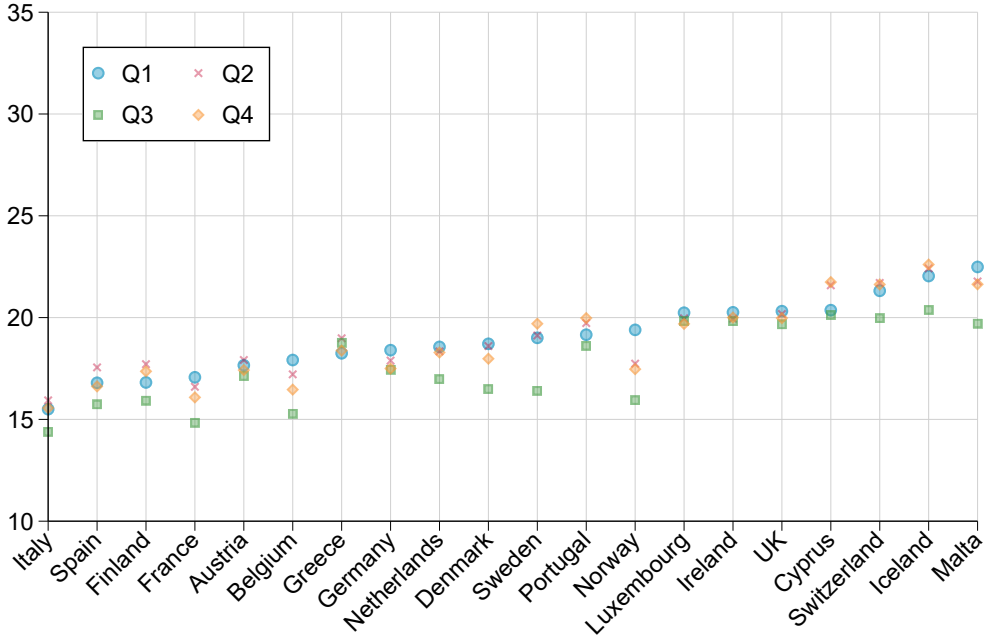
Table 7: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
A. Before Controls					
$\log 1-\tau(L)$	0.836***	0.763***	0.116	0.736***	1.045***
	(0.146)	(0.183)	(0.124)	(0.146)	(0.300)
B. Controlling for Social Spending					
$\log 1-\tau(L)$	0.380***	0.261**	0.098	0.315**	0.560*
	(0.130)	(0.120)	(0.143)	(0.120)	(0.322)
Social Protection/GDP	-0.029***	-0.032**	-0.001	-0.026***	-0.030***
	(0.007)	(0.012)	(0.006)	(0.009)	(0.010)
C. Controlling for Regulations					
$\log 1-\tau(L)$	0.125	0.262*	-0.136	0.091	-0.259
	(0.211)	(0.135)	(0.225)	(0.156)	(0.557)
Formal Employment	-0.425***	-0.122	-0.291*	-0.373***	-0.970**
	(0.147)	(0.132)	(0.153)	(0.134)	(0.412)
Labor Regulations Index	-0.180**	-0.236**	0.021	-0.171**	-0.214
	(0.090)	(0.105)	(0.078)	(0.079)	(0.205)
D. Controlling for both Social Spending and Regulations					
$\log 1-\tau(L)$	0.044	0.135	-0.109	0.015	-0.264
	(0.208)	(0.142)	(0.220)	(0.153)	(0.520)
N	126	126	126	126	126

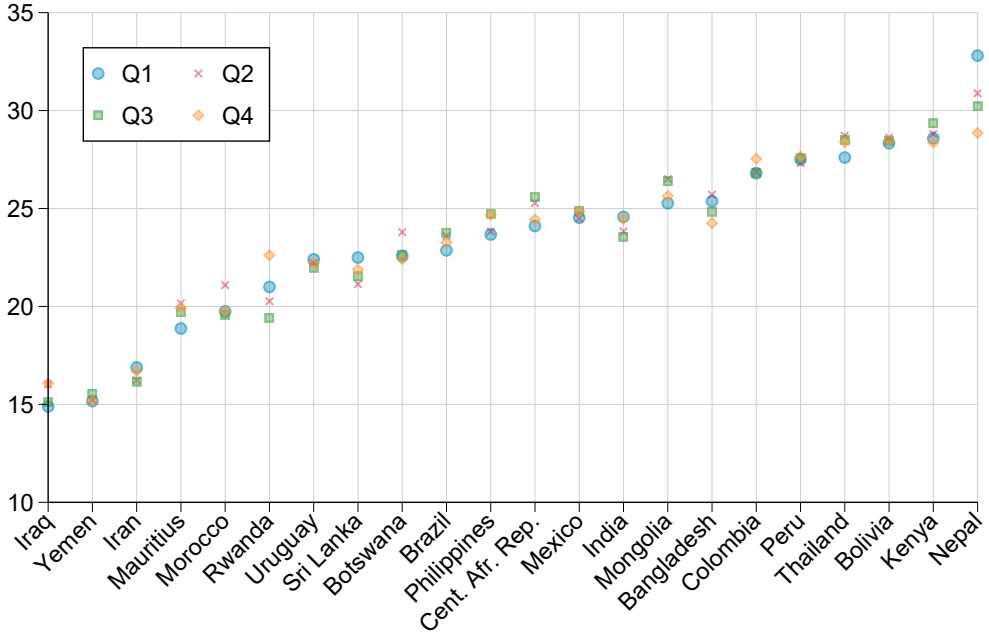
Notes. This table reports elasticities of prime-age hours worked with respect to the net-of-tax rate on labor income across countries as in Table 6A and how those elasticities are affected when adding controls for social protection spending (excluding pensions) relative to GDP in Panel B, controls for 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 these regressions, we also include log GDP per adult and Muslim/Hindu population share as in Table 6, Panel A. 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. This is why coefficients in panel A are slightly different than in Table 6, Panel A (which included 138 countries). Social protection 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 government spending reduces the elasticity of hours with respect to the net-of-labor-tax rate showing that traditional income effects from government spending 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 A.8 and display overall similar results.

Figure 1: Seasonality in Hours Worked in Western Europe and Developing Countries

(a) Western Europe



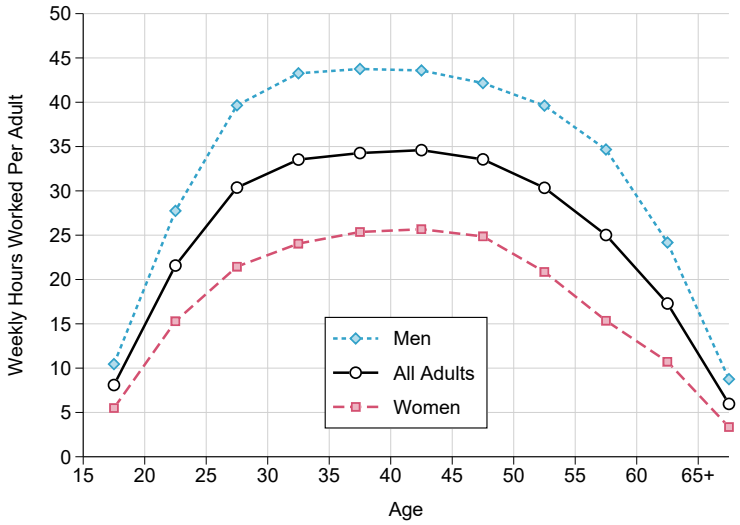
(b) Developing Countries



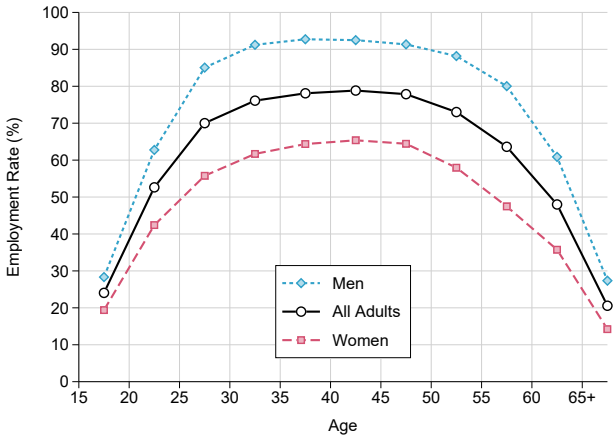
Notes: The figure depicts average hours of work per adult (aged 15+) by quarter in Western Europe (panel (a)) and developing countries (panel (b)), based on labor force surveys fielded over the entire year. Hours worked in Western Europe are generally lower in the third quarter, corresponding to the 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 2: Global Hours Worked by Age and Gender

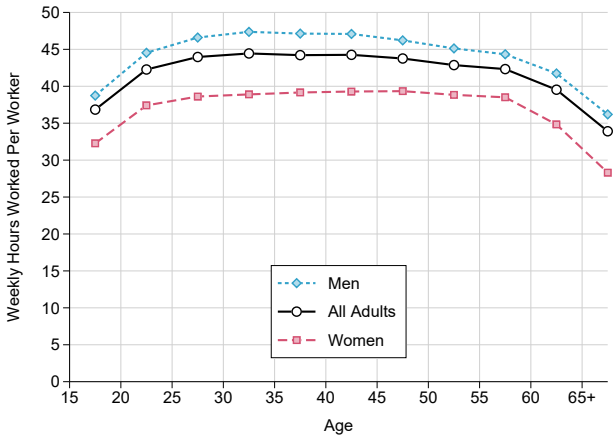
(a) Weekly Hours of Work per Adult



(b) Employment Rates



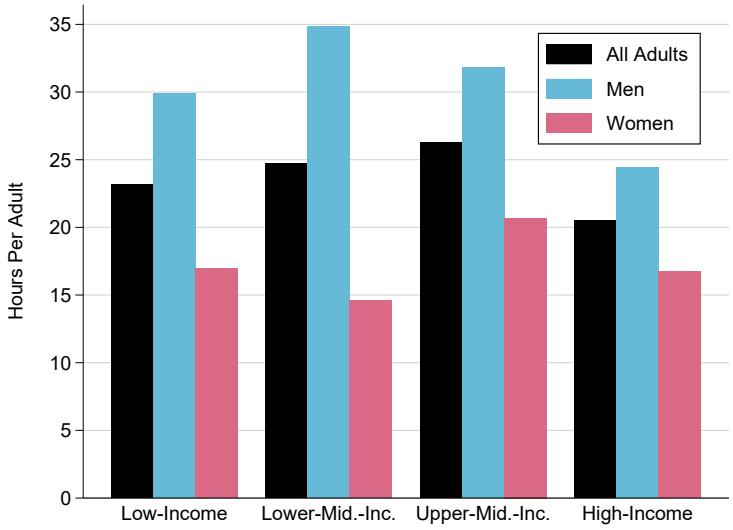
(c) Weekly Hours per Worker



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+. For each country with data (see Figure A.2), we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). 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.

Figure 3: Hours Worked by Economic Development

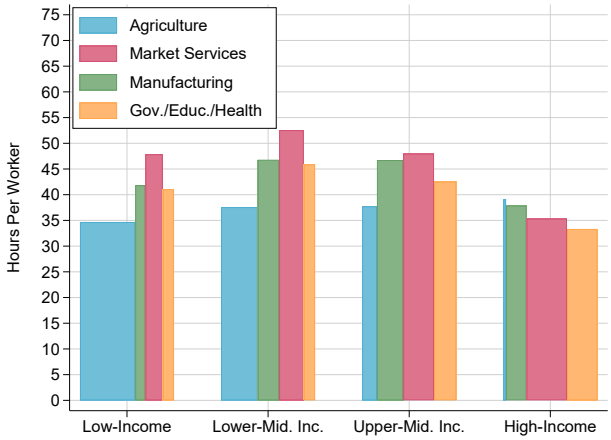
(a) Gender Groups (Hours per Adult)



(b) Age Groups (Hours per Adult)



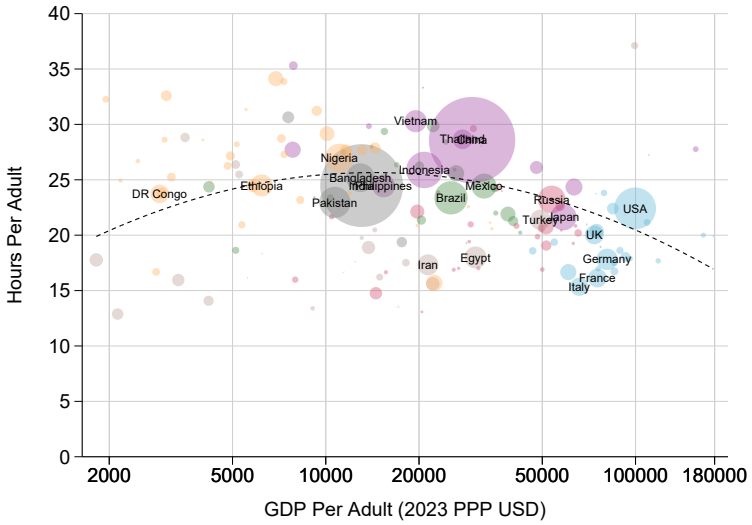
(c) Industry Groups (Hours per Worker)



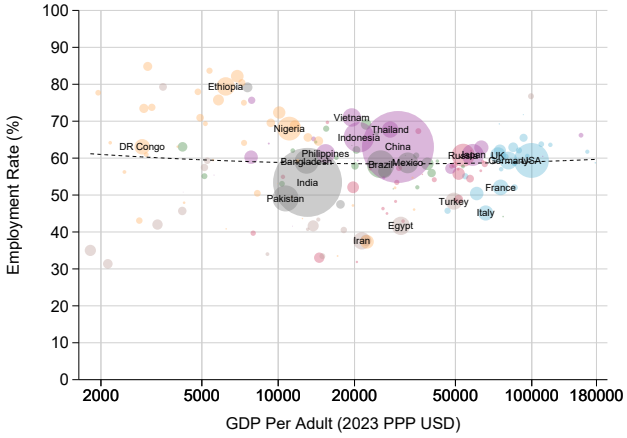
Notes: The figure depicts hours worked by stages of development using the World Bank grouping of countries as of 2023 available here. Estimates are weighted by adult population size in each country to be representative. The sample covers 97% of the world adult population. Panel (a) depicts hours of work per adult for all adults (black bars), men (blue bars), and women (pink bars). Panel (b) depicts hours of work per adult by age group: young (aged 15-19), prime-age (age 20-59), and elderly (age 60+). Panel (c) depicts hours of work per worker by industrial sector. In panels (b) and (c), the width of each bar is proportional to its population size to illustrate the enormous variations in the age structure and industrial composition by development status. Panel (a) shows that hours of work first increase modestly, and then decrease with economic development. Panel (b) shows that the same pattern holds for prime-age hours of work. In contrast, hours of work among the young and especially the elderly decrease with economic development. Panel (c) shows that hours per worker first increase slightly and then decrease sharply in all sectors except in agriculture where they increase slightly even for richer countries.

Figure 4: Hours Worked among All Adults (Aged 15+) by Country Income

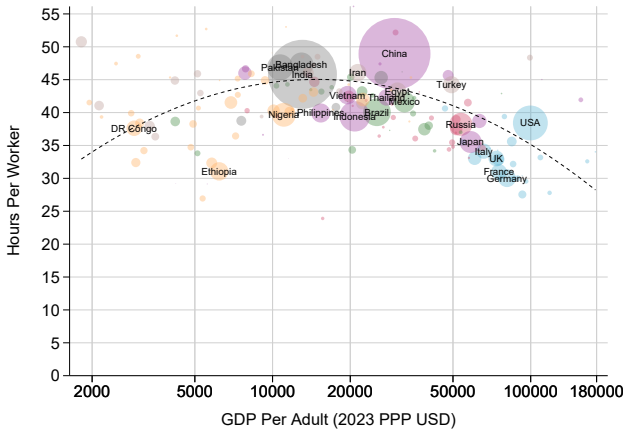
(a) Weekly Hours per Adult



(b) Employment Rate



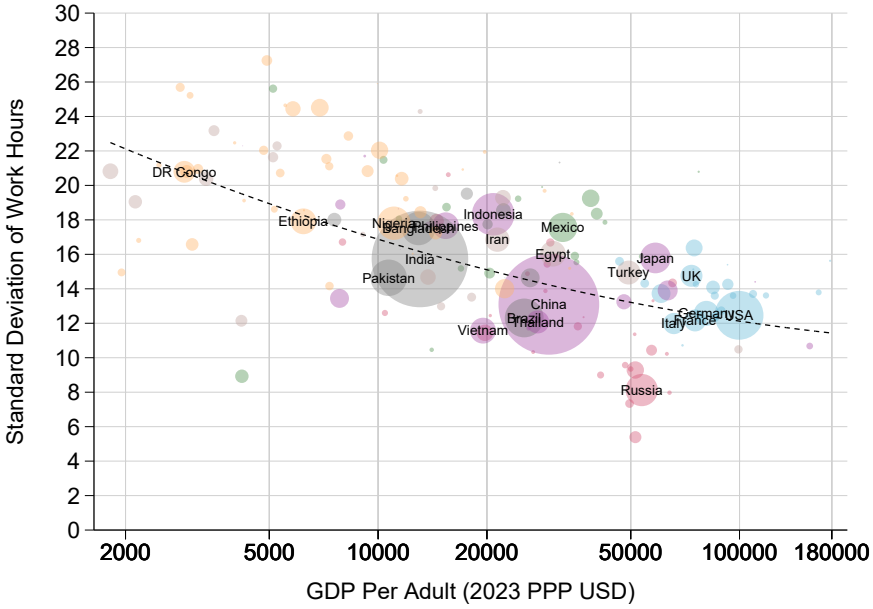
(c) Weekly Hours per Worker



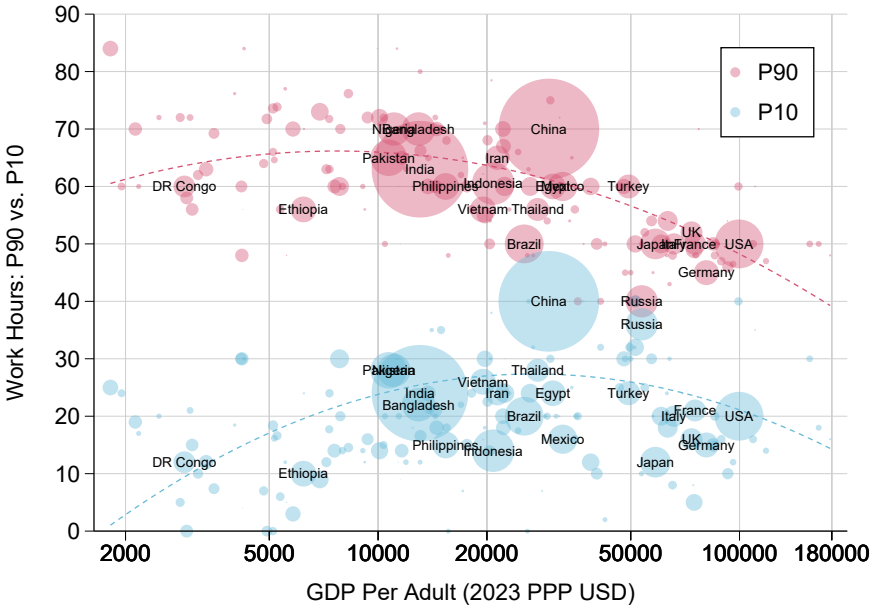
Notes: The figure depicts average weekly hours of work per adult (aged 15+) in panel (a), employment rates per adult in panel (b), and weekly hours of work per worker in panel (c) against log GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). 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 A.2. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows a bell shape of hours of work per adult with development. 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 5: Variance in Hours of Work per Worker within Countries

(a) Standard Deviation in Weekly Hours per Worker

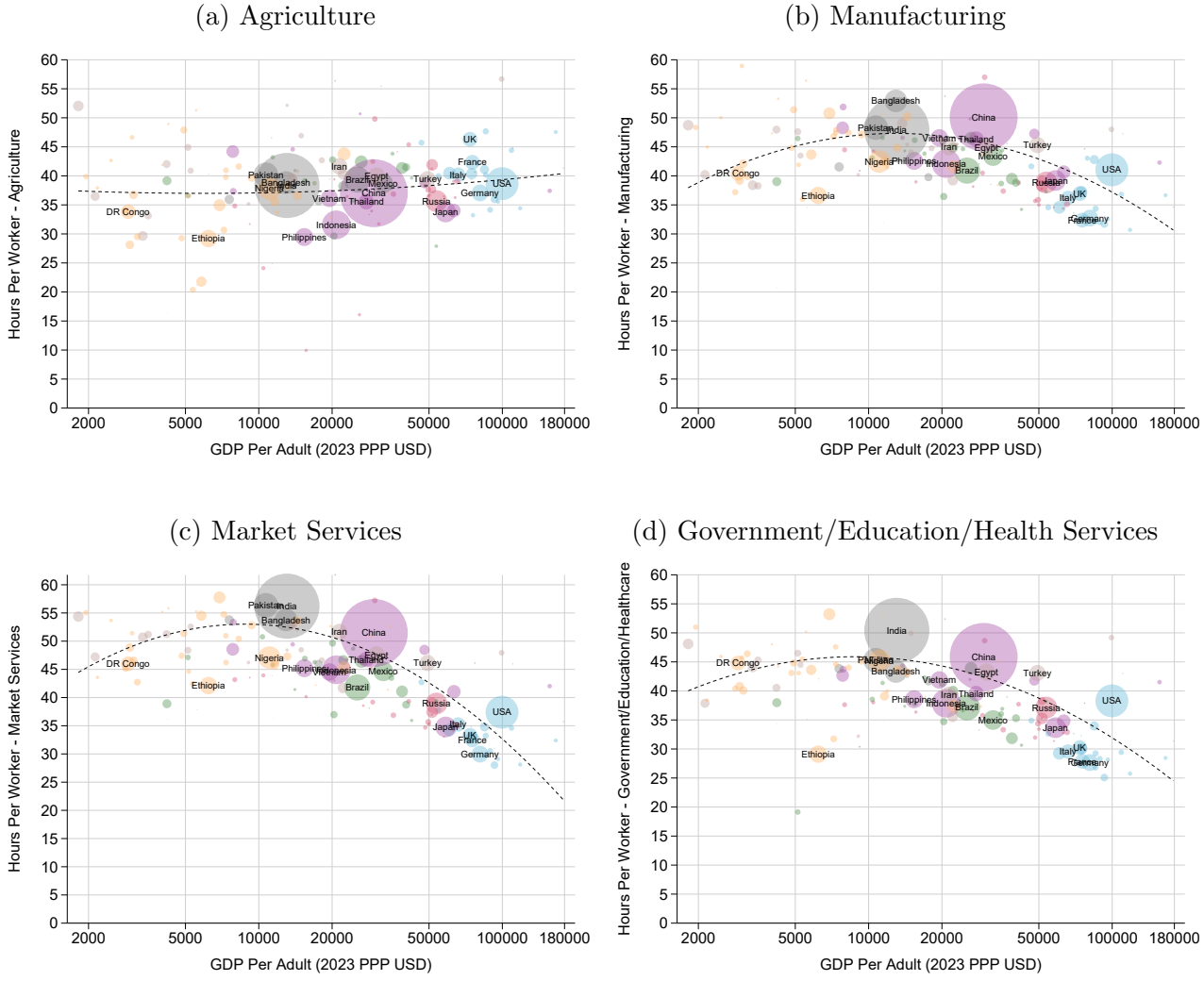


(b) 10th and 90th Percentiles of Hours per Worker



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 A.9). 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 A.2. 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.

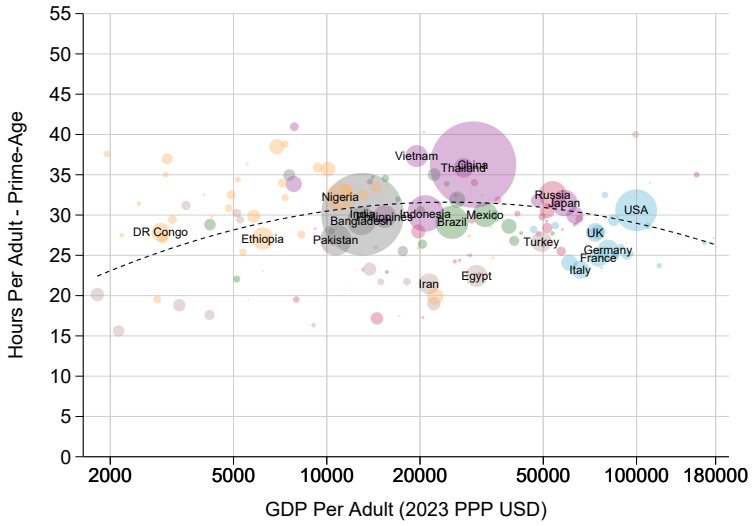
Figure 6: Hours of Work per Worker by Country and Industry



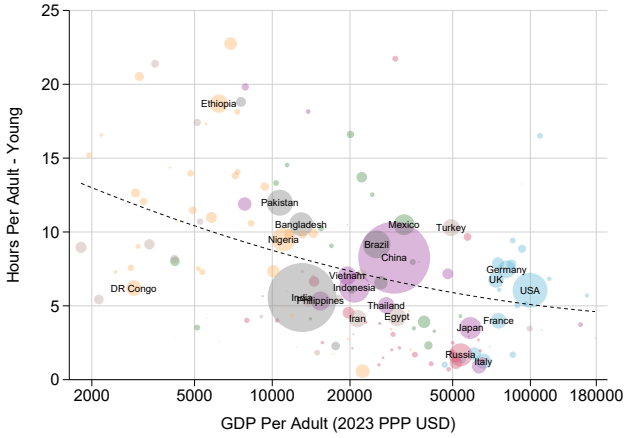
Notes: The figure depicts average weekly hours of work per worker by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). Each country's circle's area is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A.2. 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 7: Hours of Work per Adult by Country and Age Groups

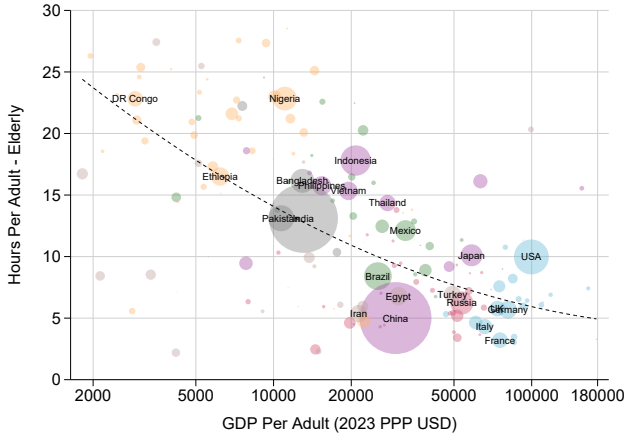
(a) Prime-Age Adults (Aged 20-59)



(b) Young (Aged 15-19)



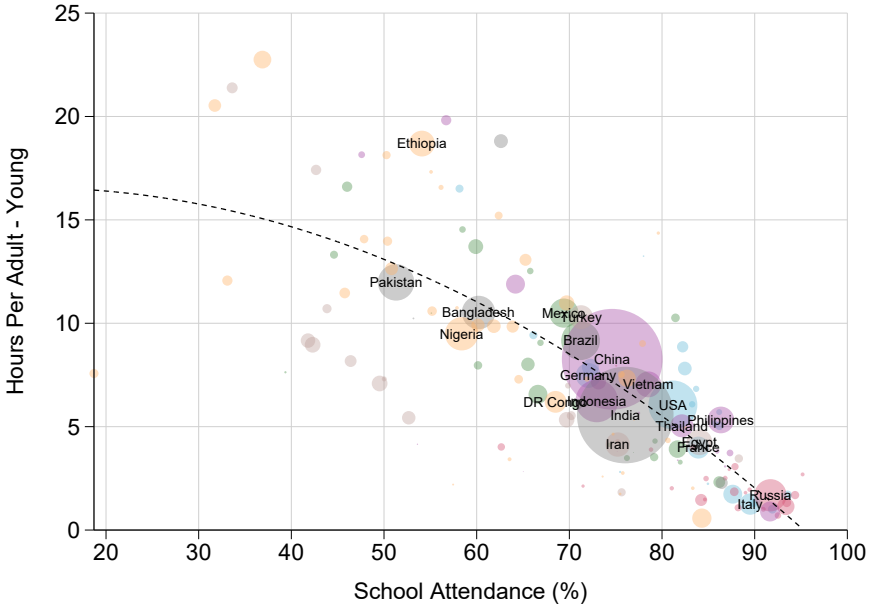
(c) Elderly (Aged 60+)



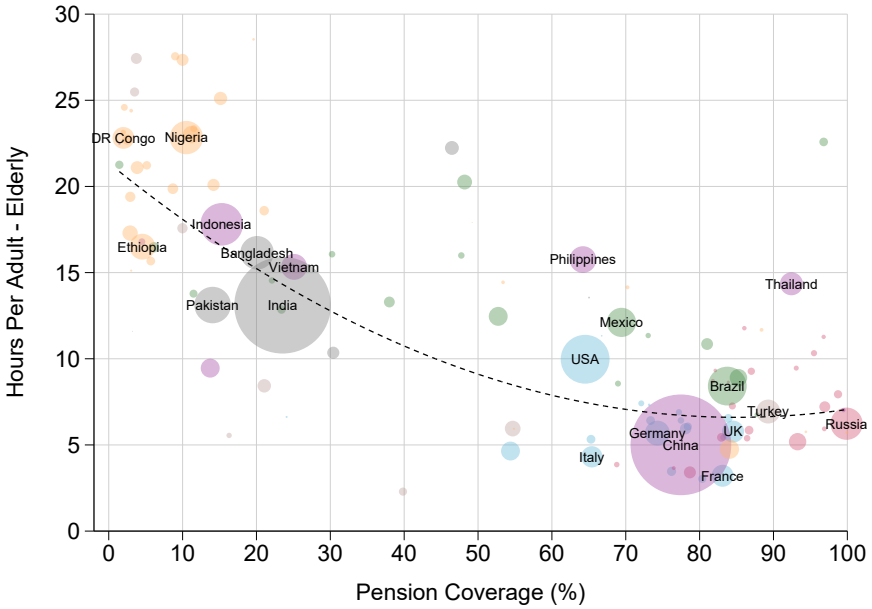
Notes: The figure depicts average weekly hours of work per adult for prime-age adults (aged 20-59) in panel (a), for the young (aged 15-19) in panel (b), and for the elderly (aged 60+) in panel (c) by country ranked by GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). 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 A.2. The best quadratic fit of the weighted circles is represented by the dashed curve. Panel (a) shows a weak inverted U-shape 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 8: Schools and Pensions and Hours Worked by the Young and Elderly

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



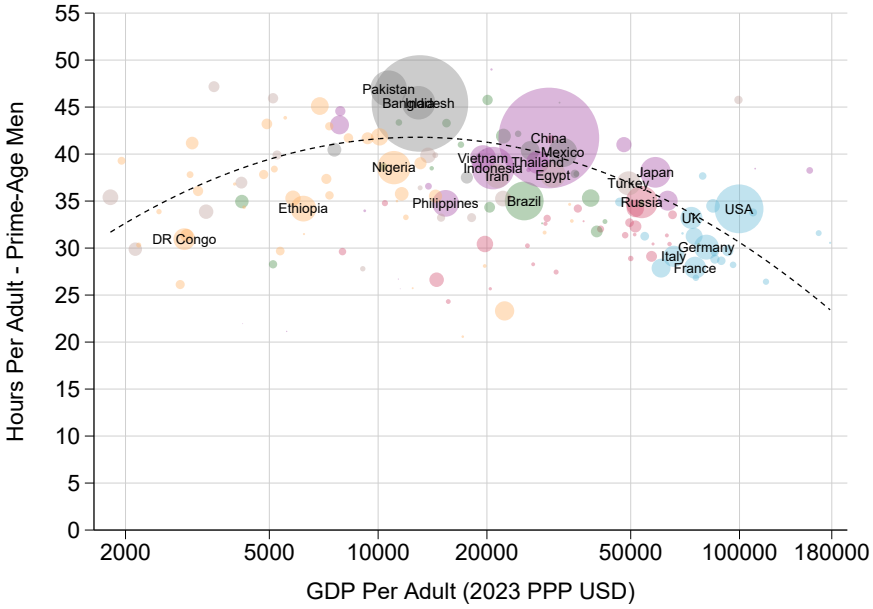
(b) Pension Coverage and Hours of Work of the Elderly (60+)



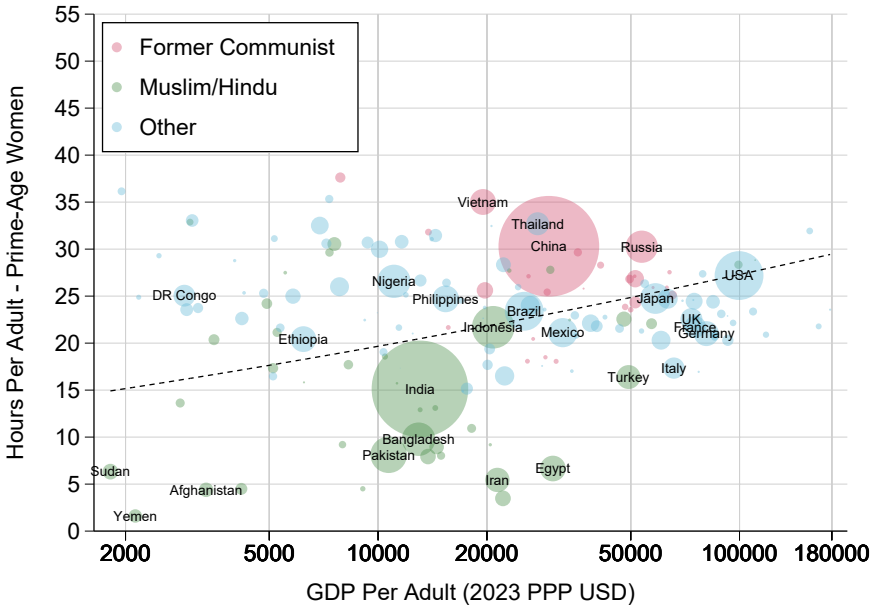
Notes: Panel (a) depicts the correlation between school attendance and hours of work among the young (age 15-19). Panel (b) depicts the correlation between pension coverage and hours of work among the elderly (age 60+). Pension coverage is defined as the fraction of the elderly living in a household where at least one person is receiving a pension. 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 A.9). 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 A.2. 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 9: Hours of Work per Adult by Country: Prime-Age Men and Women

(a) Men (Aged 20-59)



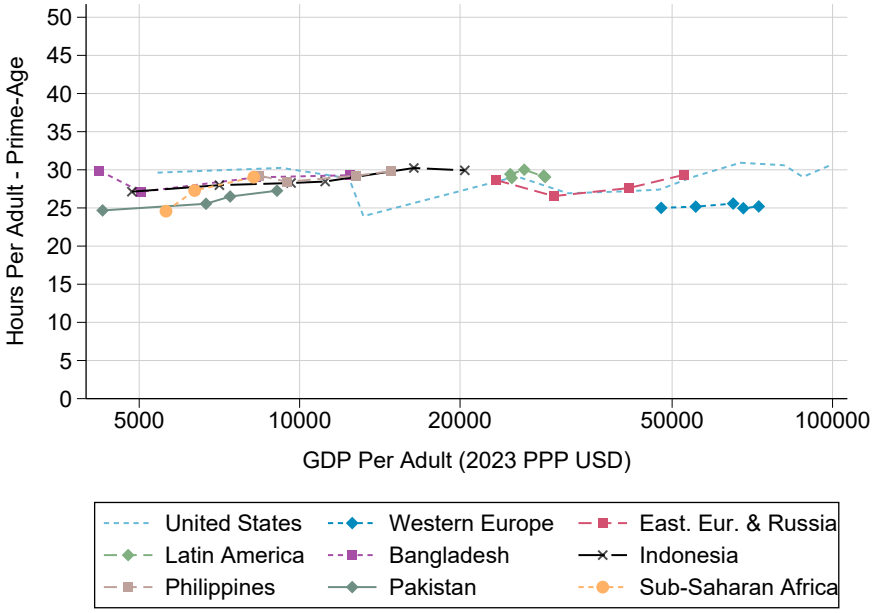
(b) Women (Aged 20-59)



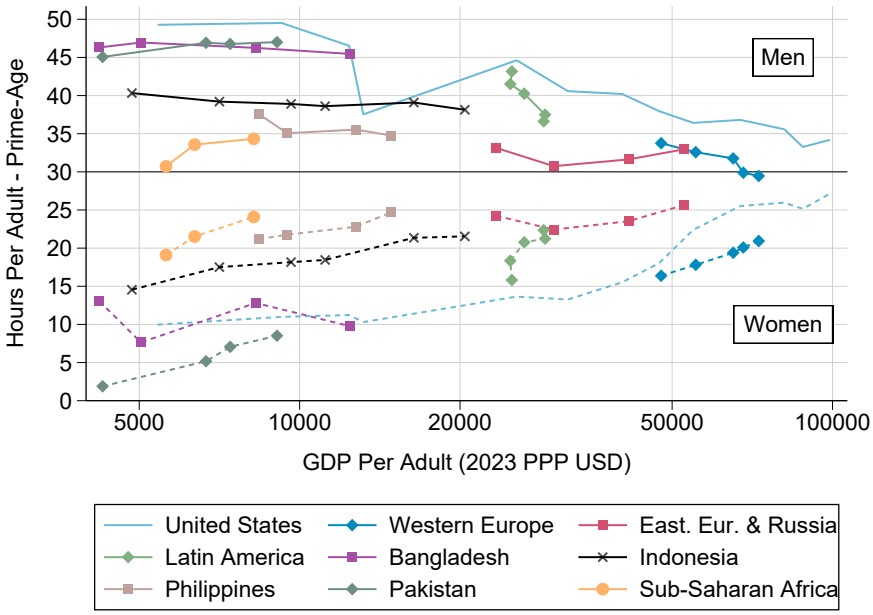
Notes: The figure depicts average weekly hours of work per adult for prime-age men in panel (a), and prime-age women in panel (b), against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see Appendix Table A.9). 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 A.2. 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 A.14(a)).

Figure 10: Evolution of Hours of Work: Prime-Age Adults

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



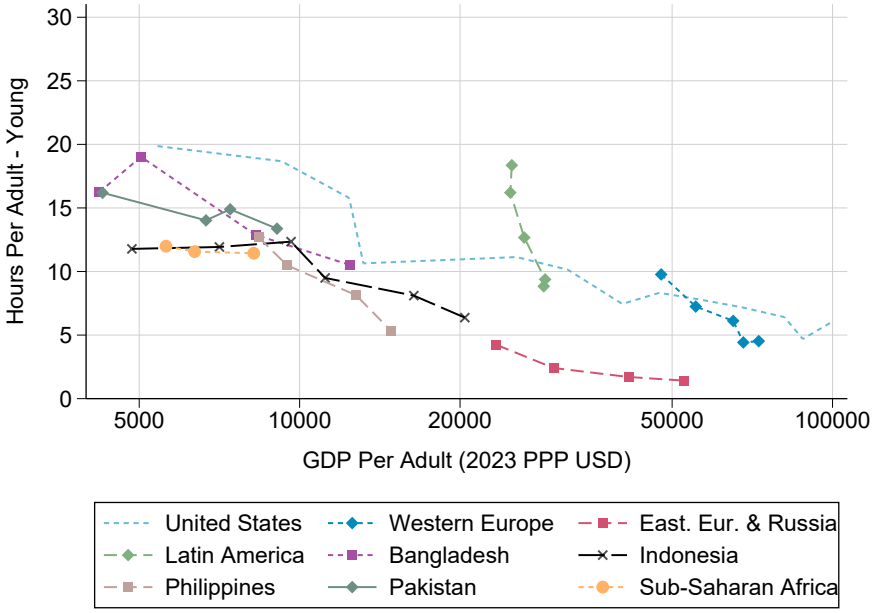
(b) Men vs. Women (Aged 20-59)



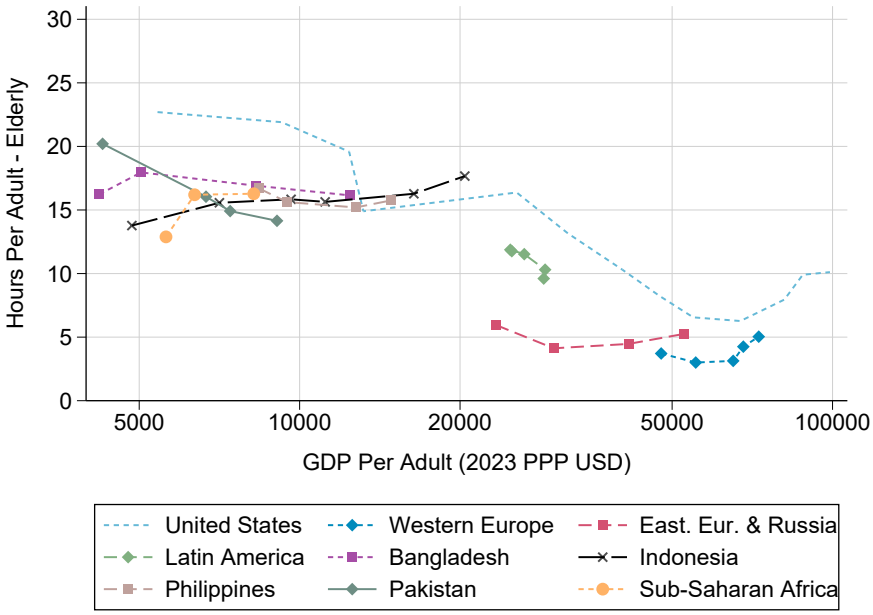
Notes: The figure depicts the evolution by decade of average weekly hours of work per person for prime-age adults (age 20-59) in panel (a), and separately for prime-age men and prime-age women in panel (b) for regions and countries for which we have long time series available. Hours are plotted against 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 Francis and Ramey (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).

Figure 11: Evolution of Hours of Work: Young and Elderly

(a) Young (age 15-19)



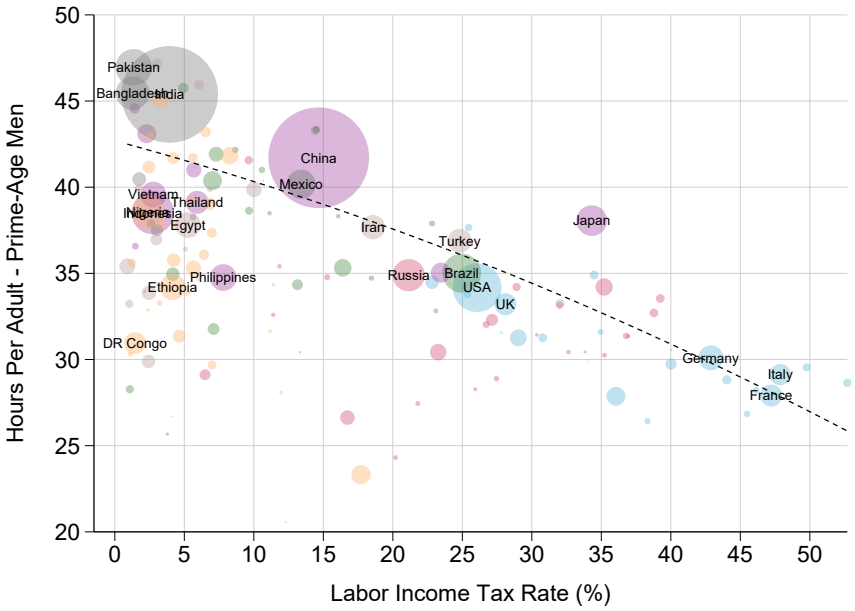
(b) Elderly (age 60+)



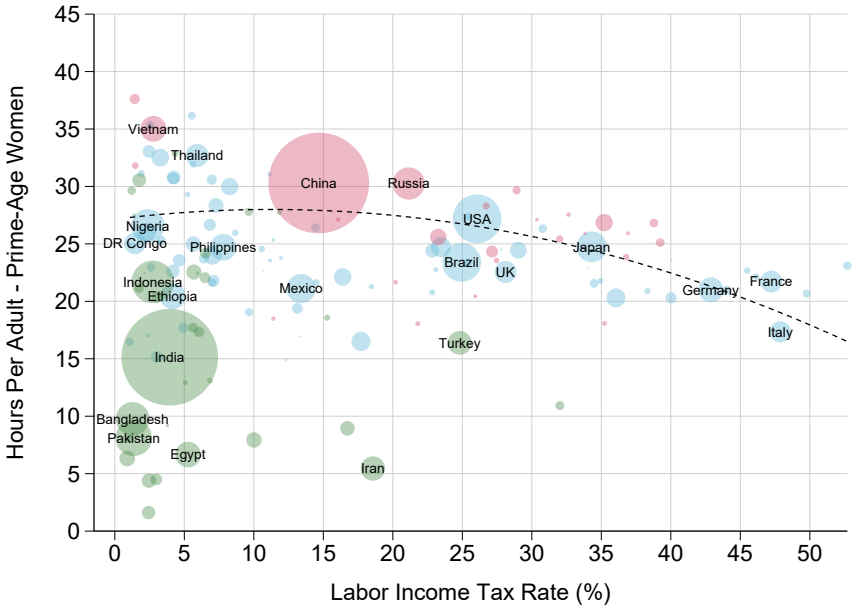
Notes: The figure depicts the evolution by decade of average weekly hours of work per adult for the young (age 15-19) in panel (a), and for the elderly (age 60+) in panel (b) for regions and countries for which we have long time series available. Hours are plotted against country or region GDP per adult 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 Francis and Ramey (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 12: Labor Taxes and Hours of Work of Prime-Age Adults

(a) Men



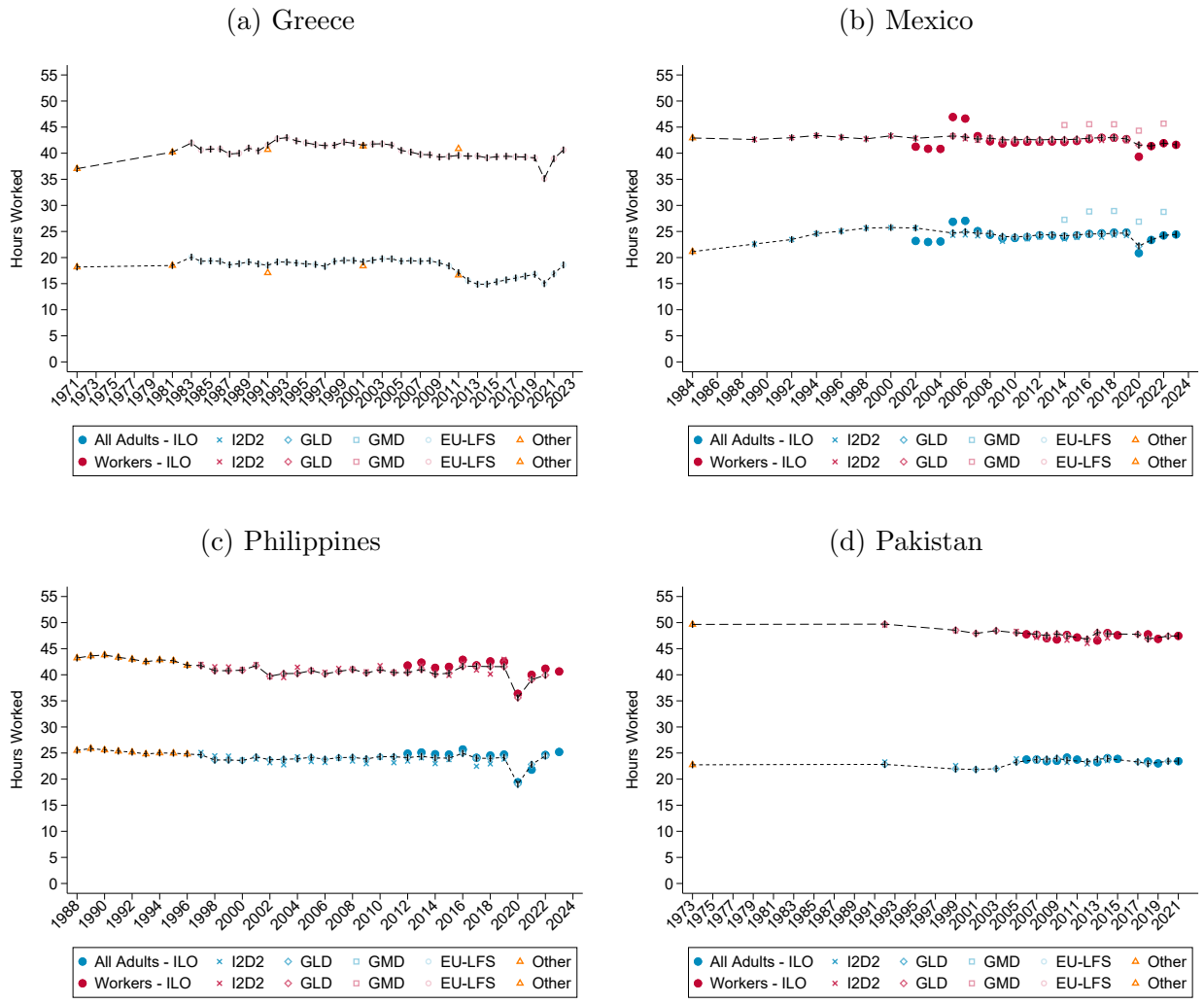
(b) Women



Notes: The figure depicts the correlation between average labor tax rates and hours of work per adult for prime-age men in panel (a) and prime-age women 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 A.9). 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 A.2. 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. For women, the best quadratic fit excludes Muslim/Hindu countries. Average labor tax rates are from Bachas et al. (2022). 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 negative correlation also holds for women if we exclude Muslim/Hindu countries.

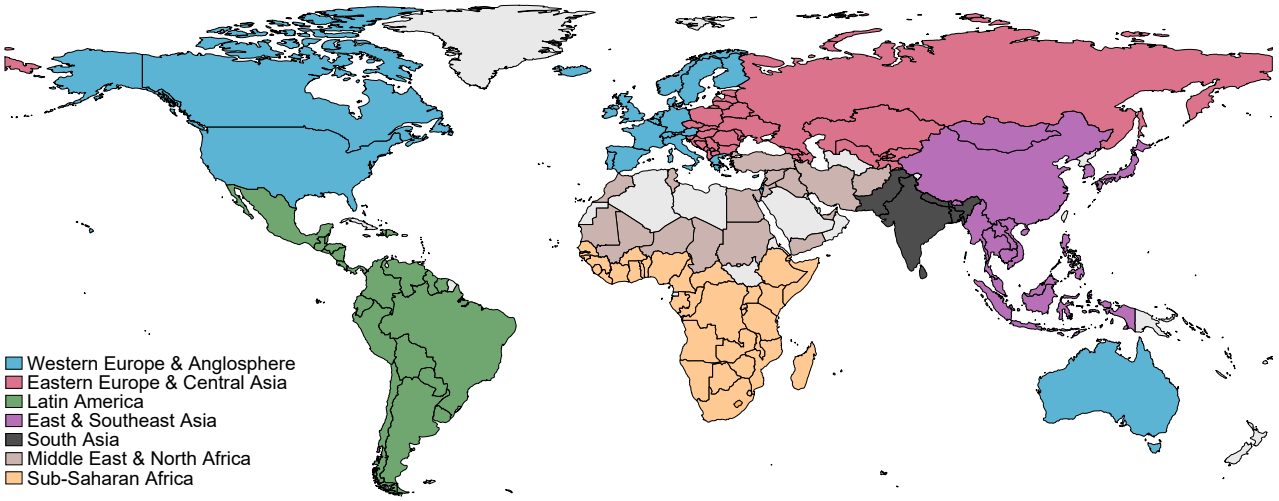
ONLINE APPENDIX

Figure A.1: 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 Labor 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).

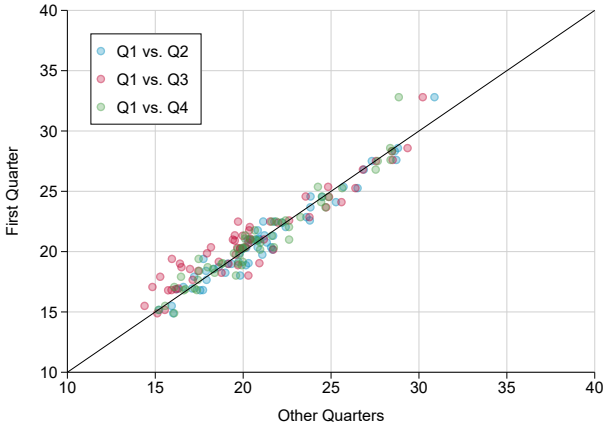
Figure A.2: Data Coverage and World Regions



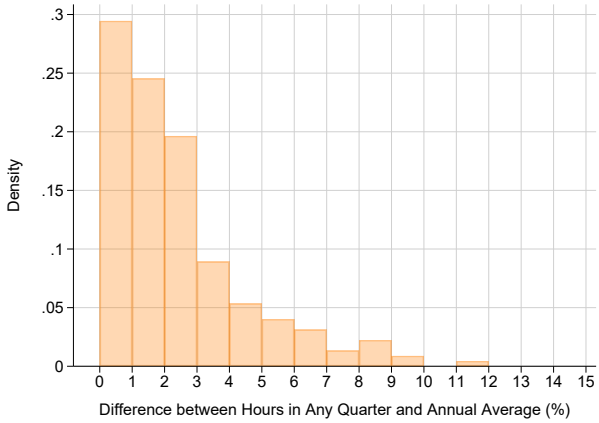
Notes: The figure depicts all the countries for which recent hours worked survey data are available for our analysis as well as the regions' breakdown that we will use. Relative to the usual partition of countries by regions, the region Middle East & North Africa is expanded to include Saharian/Sahel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

Figure A.3: Seasonality in Hours Worked

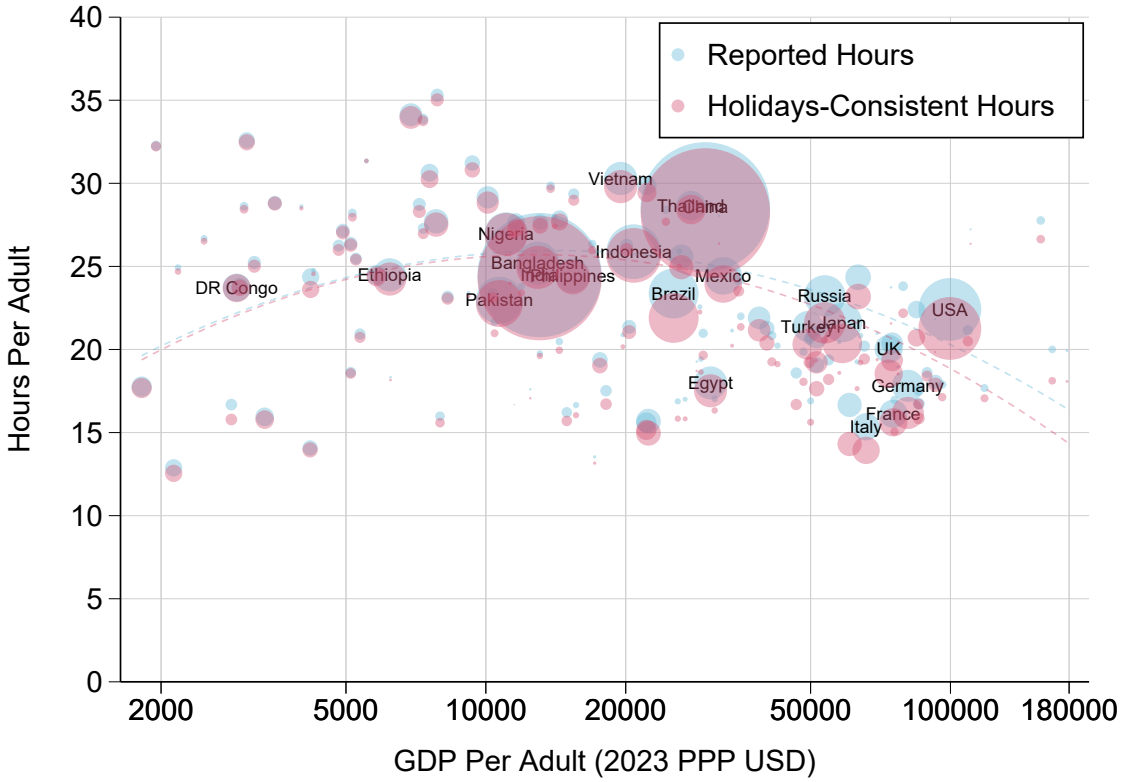
(a) Hours per Adult by Quarter



(b) Distribution of Quarterly Deviations in Hours Worked Relative to Annual Average



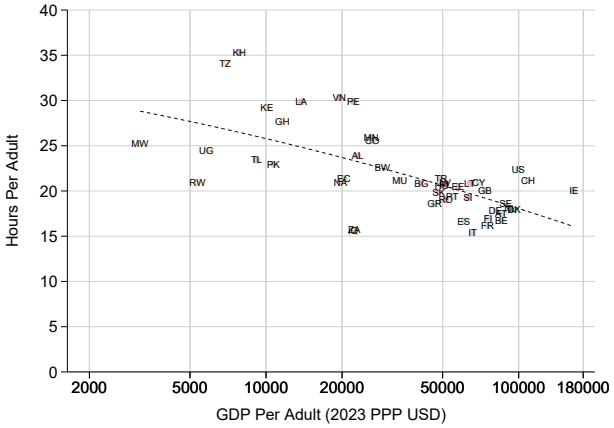
(c) Observed vs. Holidays-Consistent Hours Worked Over the Course of Development



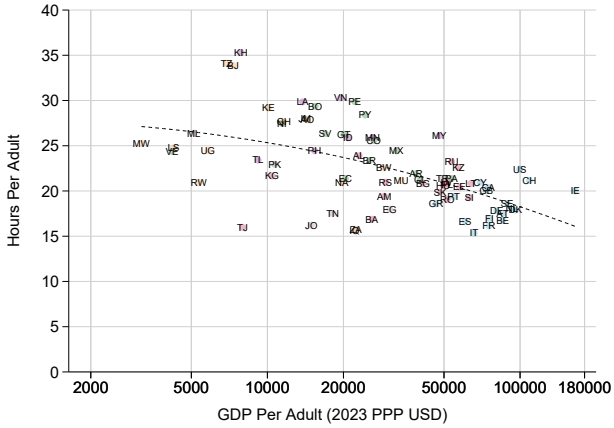
Notes: Panels (a) and (b) compare hours per adult observed across quarters, based on 224 nationally representative surveys that were fielded in 56 countries throughout the year and provide information on the quarter of interview. Panel (a) compares hours per adult aged 15+ in the first quarter versus 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 4(a)) and after making the share of workers with zero hours consistent with legal paid annual leave time in each country (see main text). The best quadratic fit (with countries weighted by population) is depicted in dashed lines.

Figure A.4: Comparison with Bick, Fuchs-Schündeln, and Lagakos (2018)

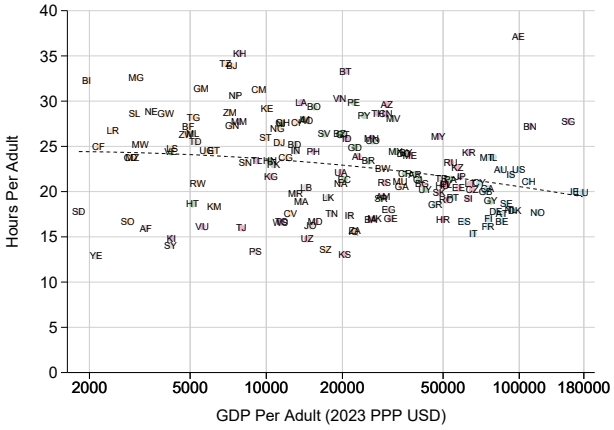
(a) Bick et al. (2018) Core Countries



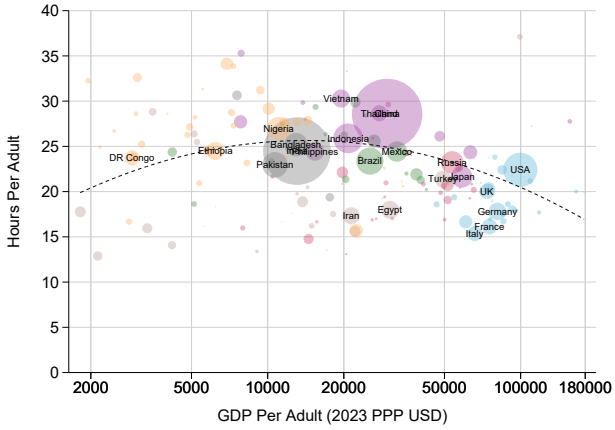
(b) Bick et al. (2018) Full Sample



(c) Our Sample



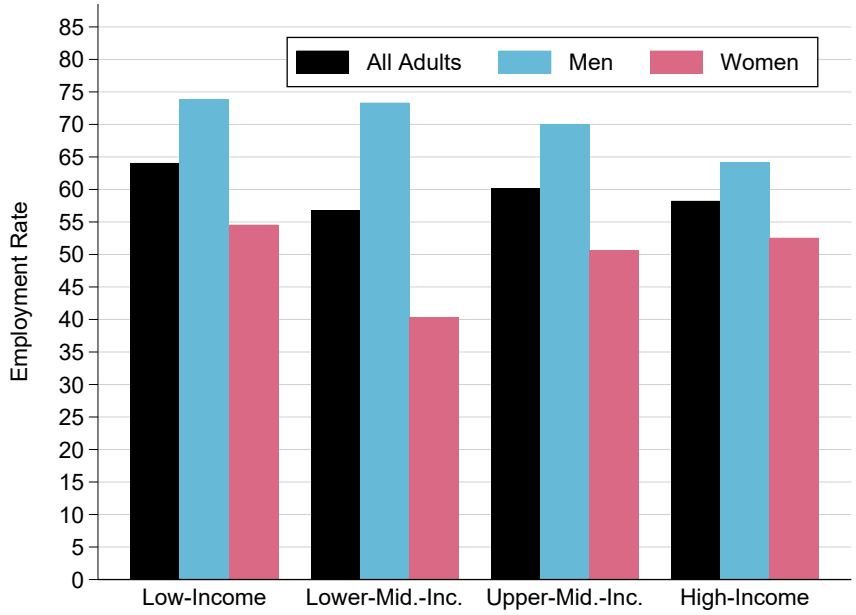
(d) Our Sample (Population-Weighted)



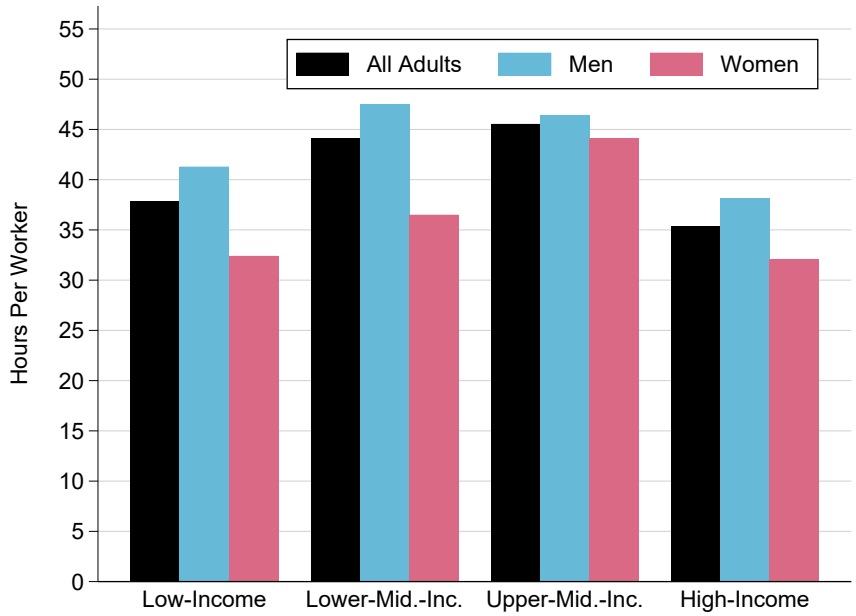
Notes: The figure compares weekly hours per adult over the course of development in the sample of countries studied by Bick, Fuchs-Schündeln, and Lagakos (2018) with our database on global hours worked. Panel (a) plots hours per adult versus GDP per adult in our database when restricting the analysis to the 49 core countries studied in Bick, Fuchs-Schündeln, and Lagakos (2018). Panel (b) does the same for the 80 countries covered in the Bick, Fuchs-Schündeln, and Lagakos (2018) full database. Panel (c) extends the analysis to all 160 countries in our data. Panel (d) adds population weights as in our benchmark Figure 4(a). In each panel, we depict the best quadratic fit in dashed line.

Figure A.5: Hours Worked by Gender and Development: Intensive vs. Extensive Margins

(a) Employment Rate



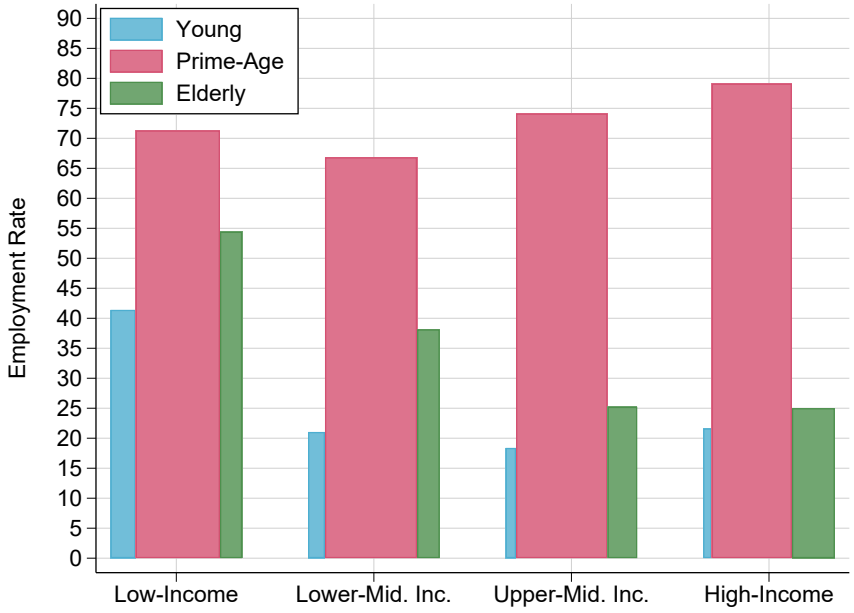
(b) Hours per Worker



Notes: The figure depicts hours worked by gender and stages of development using the World Bank grouping of countries as of 2023 along the extensive and intensive margins (see main text Figure 3(a) for unconditional hours per adult). Estimates are weighted by adult population size in each country to be representative. The sample covers 97% of the world adult population. Panel (a) depicts employment rates of all adults (black bars), men (blue bars), and women (pink bars). Panel (b) depicts hours per worker (black bars), men (blue bars), and women (pink bars). Employment rates are approximately stable across income groups for all adults with a slight bell-shape for men and a slight U-shape for women. Hours of work per worker are bell shaped with development for all, men, and women.

Figure A.6: Hours Worked by Age and Development: Extensive vs. Intensive Margins

(a) Employment Rate

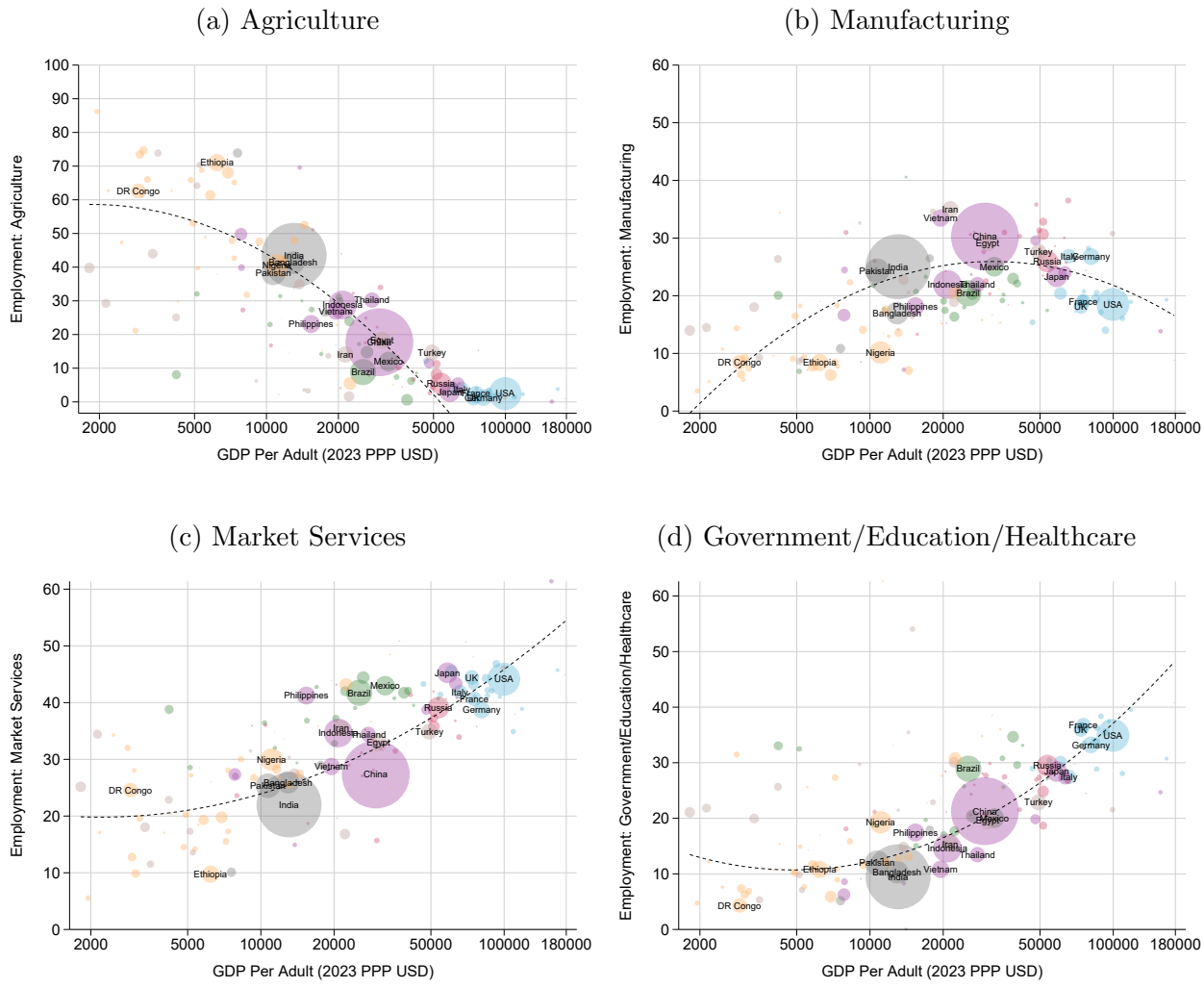


(b) Hours per Worker



Notes: The figure depicts hours worked by age and stages of development using the World Bank grouping of countries as of 2023 along the extensive and intensive margins (see main text Figure 3(b) for unconditional hours per adult). Estimates are weighted by adult population size in each country to be representative. The sample covers 97% of the world adult population. Panel (a) depicts employment rates by age group: young (aged 15-19), prime-age (aged 20-59), and elderly (aged 60+). Panel (b) depicts hours per worker by age group. The width of each bar is proportional to its population size to illustrate the large variations in the age structure by development status. Employment rates increase for the prime-age and decrease for the young and elderly with development. Hours of work per worker are bell shaped with development for all age groups.

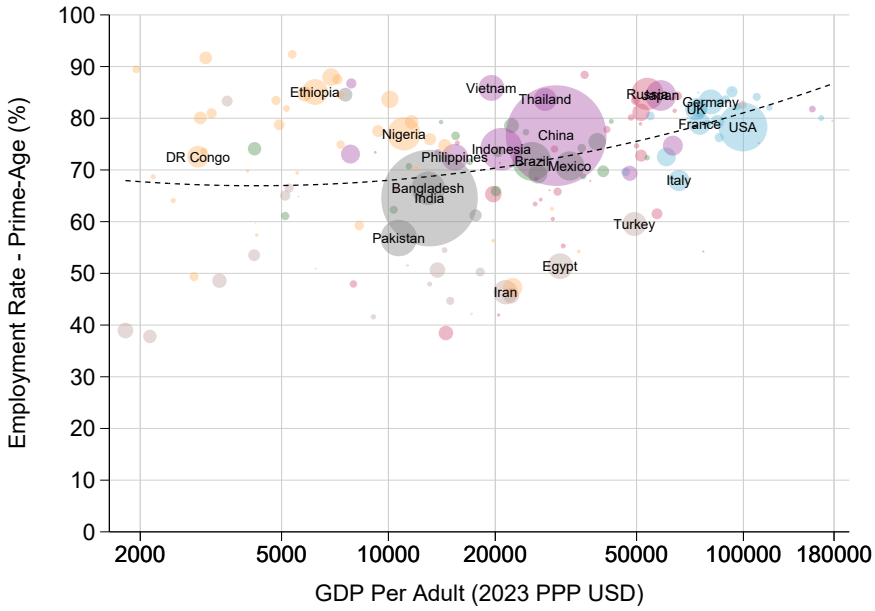
Figure A.7: Employment by Sector Over the Course of Development



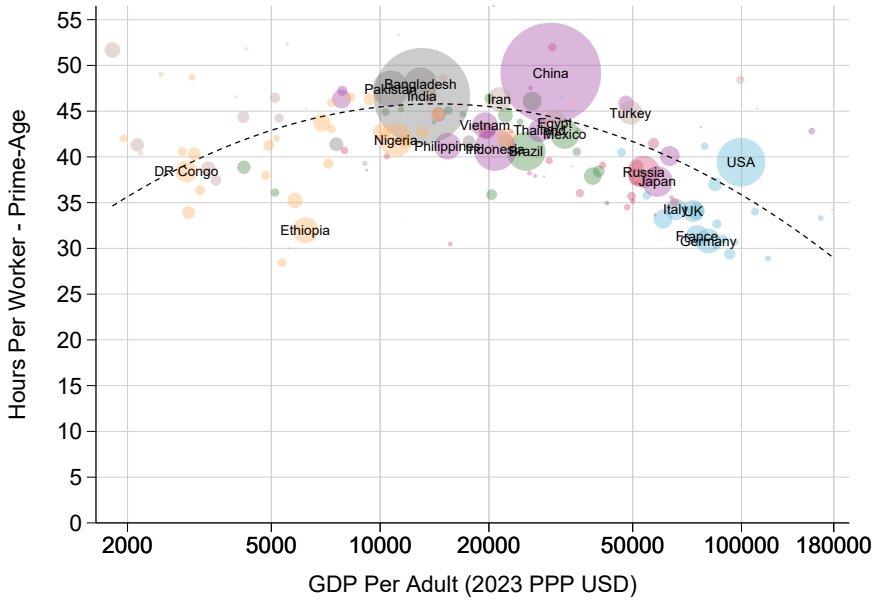
Notes: The figure depicts employment rates (among all adult workers) by industry against GDP per adult in 2023 PPP USD. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). Each country's circle's area is proportional to its adult population; the largest countries' names are depicted. Colors correspond to world regions as depicted in Figure A.2. 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. Panel (c) shows that the shares of workers in market services and government services increase with development.

Figure A.8: Hours Worked among Prime-Age Adults: Extensive vs. Intensive Margins

(a) Employment Rate



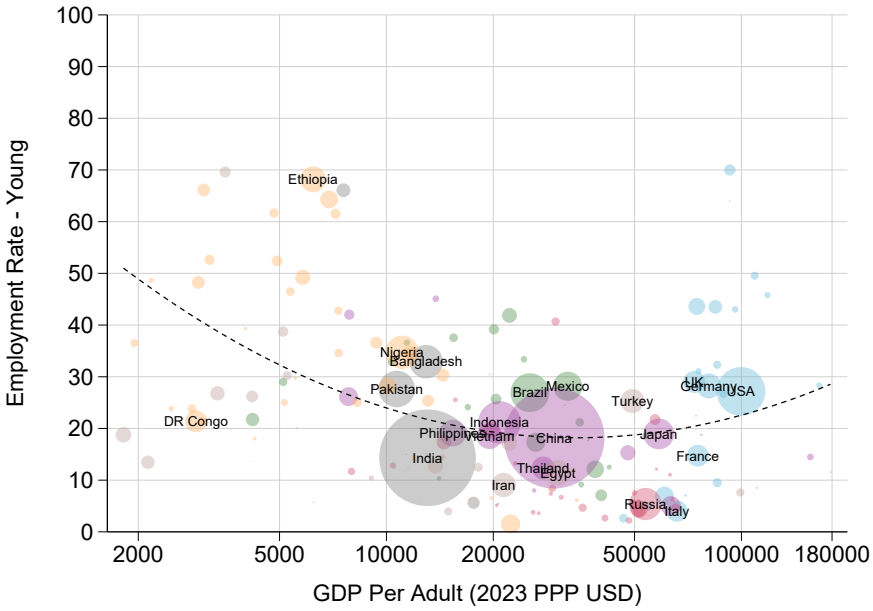
(b) Hours per Worker



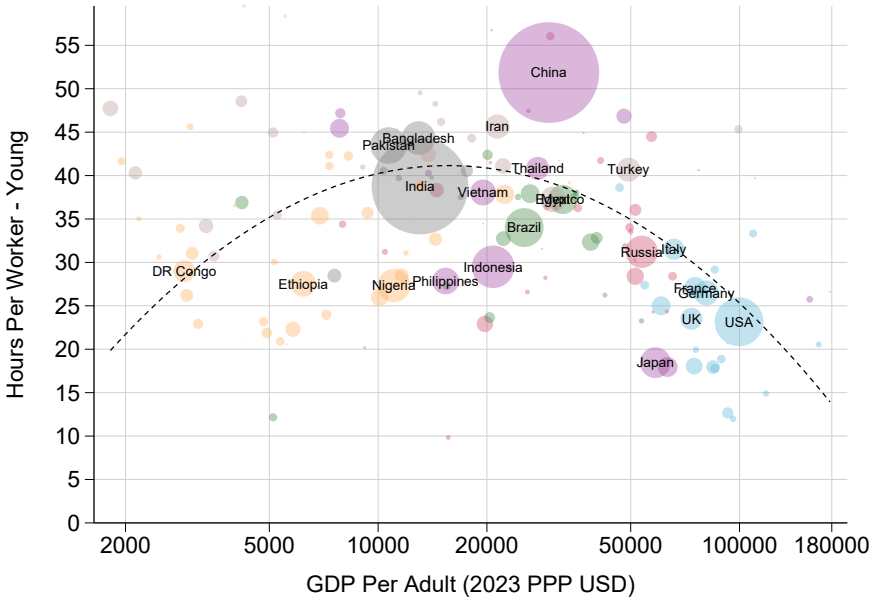
Notes: The figure depicts average hours worked among prime-age adults (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(a) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 A.2. 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 A.9: Hours Worked among Young Adults: Extensive vs. Intensive Margins

(a) Employment Rate



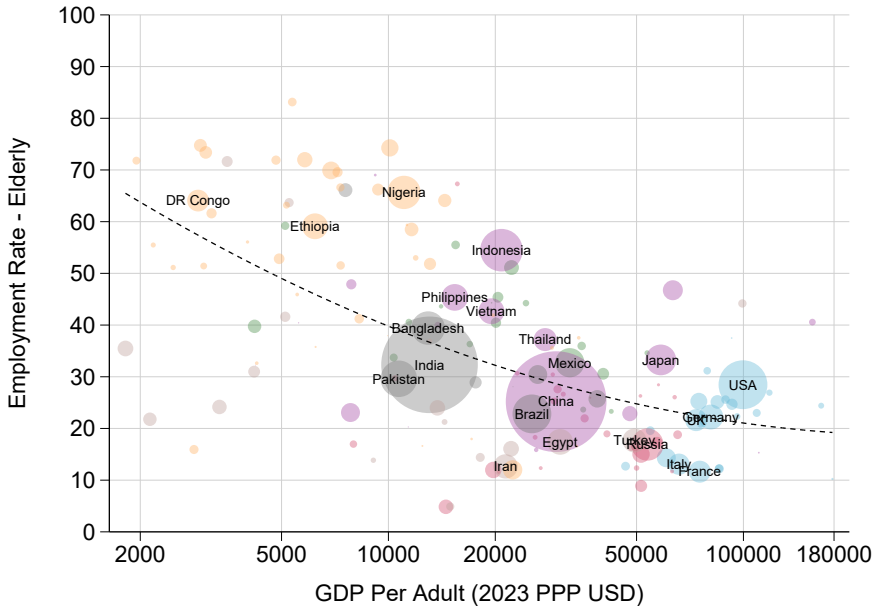
(b) Hours per Worker



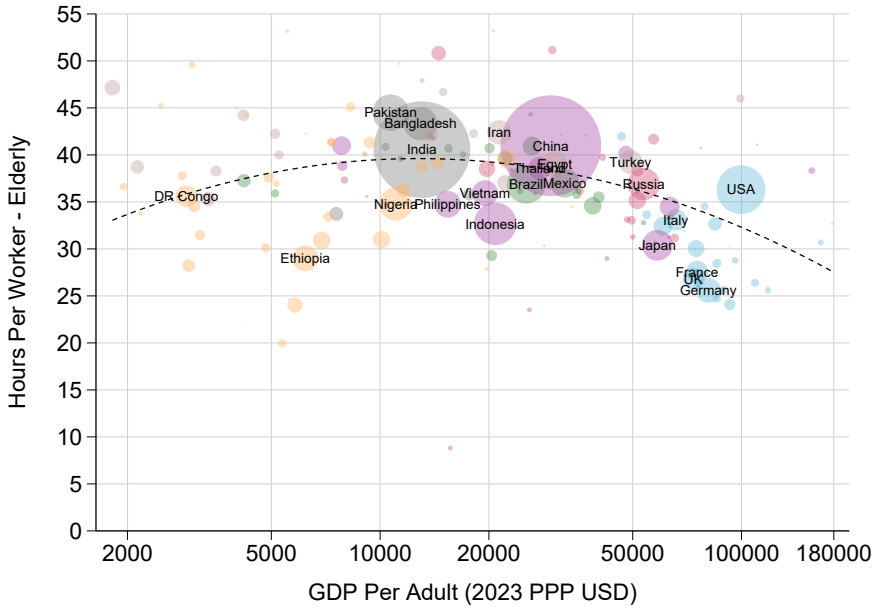
Notes: The figure depicts average hours worked among the young (age 15-19) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 A.2. 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 A.10: Hours Worked among the Elderly: Extensive vs. Intensive Margins

(a) Employment Rate



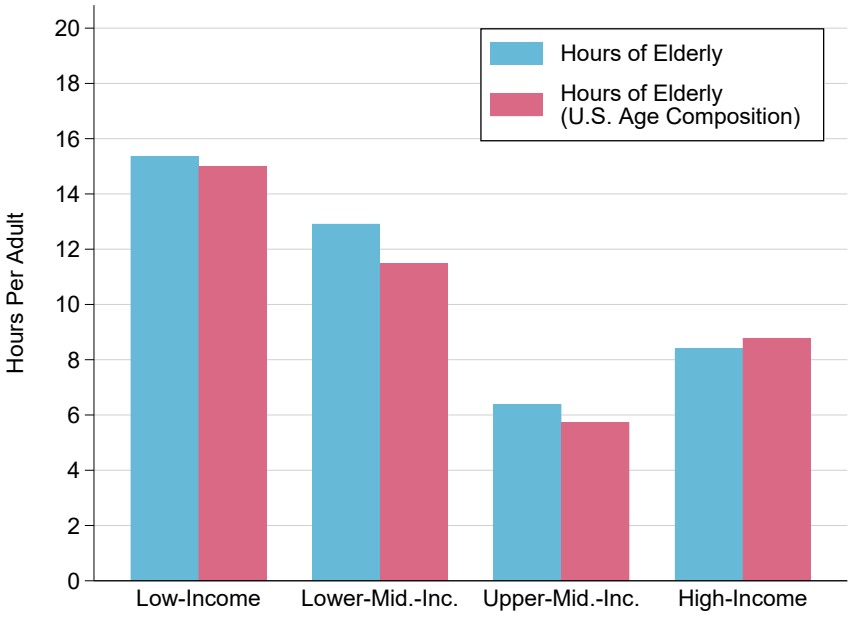
(b) Hours per Worker



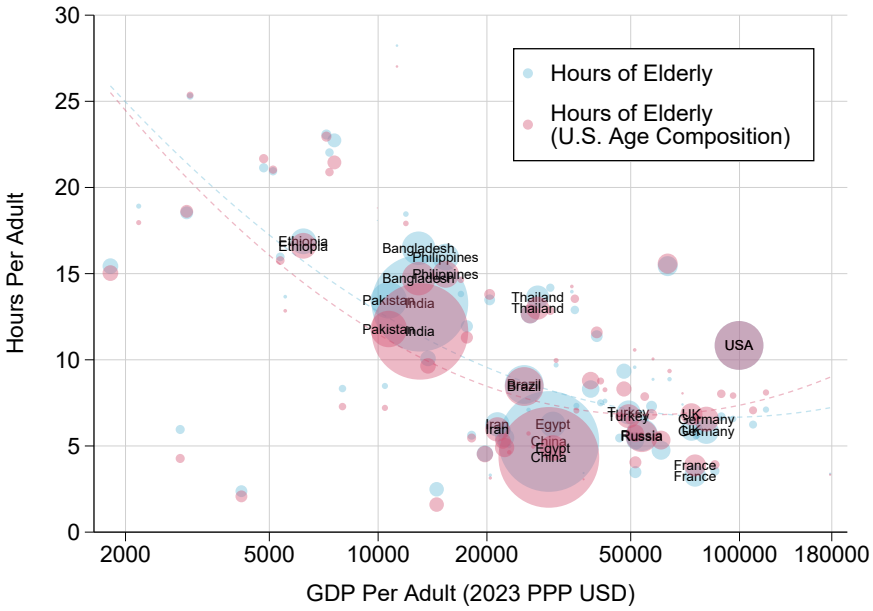
Notes: The figure depicts average hours worked among the elderly (age 60+) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 7(c) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 A.2. 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 are bell shaped with development.

Figure A.11: Hours Worked by the Elderly: Controlling for the Age Structure

(a) Hours of the Elderly and the Age Structure: 4 Groups



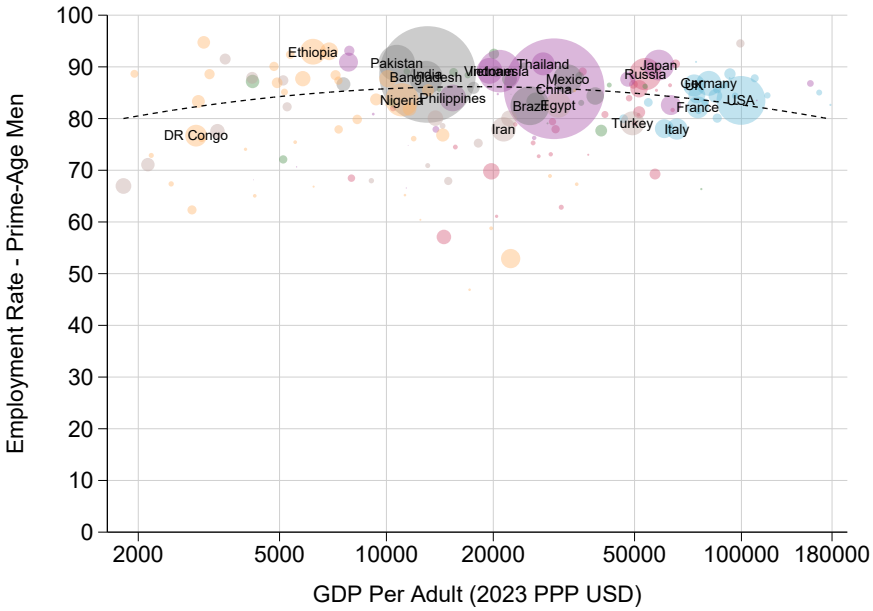
(b) Hours of the Elderly and the Age Structure: All Countries



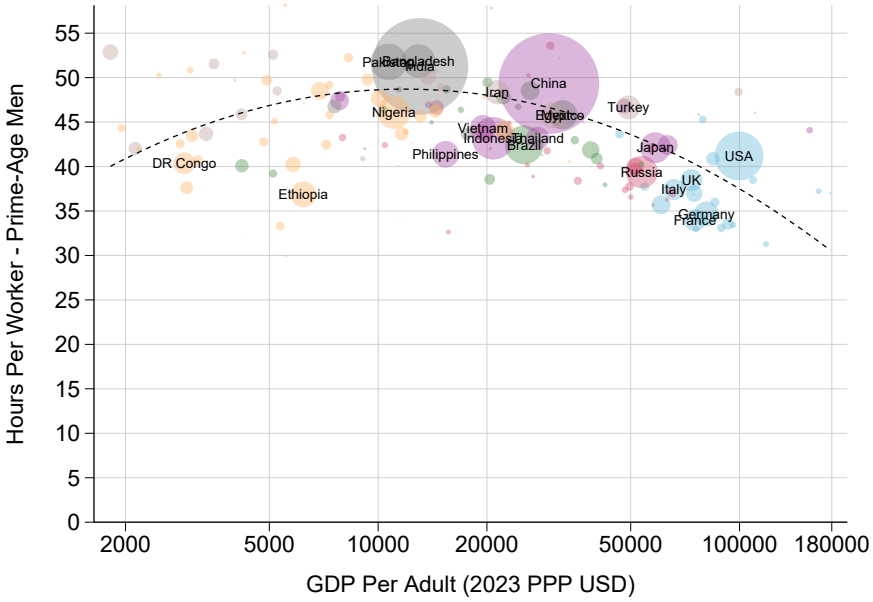
Notes: The figure compares actual hours of work of the elderly (aged 60+) to hours of work of the elderly after reweighting each age group to match the U.S. age composition. Panel (a) considers the World Bank four groups and panel (b) depicts each country individually. Overall, adjusting for the age composition of the elderly has only a fairly modest impact on elderly hours of work and does not change the overall pattern.

Figure A.12: Hours of Work of Prime-Age Men: Extensive vs. Intensive Margins

(a) Employment Rate



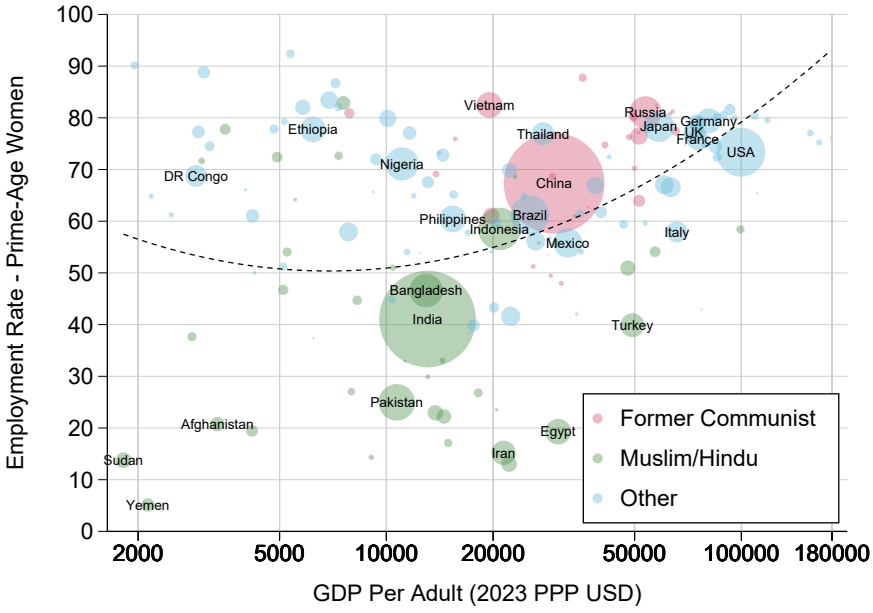
(b) Hours per Worker



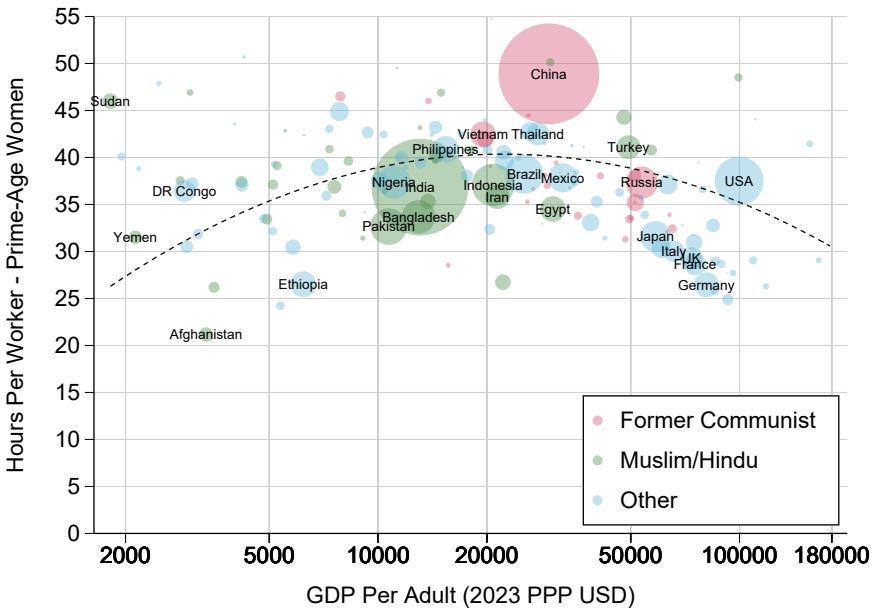
Notes: The figure depicts average hours worked among prime-age men (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 9(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 A.2. 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 A.13: Hours of Work of Prime-Age Women: Extensive vs. Intensive Margins

(a) Employment Rate



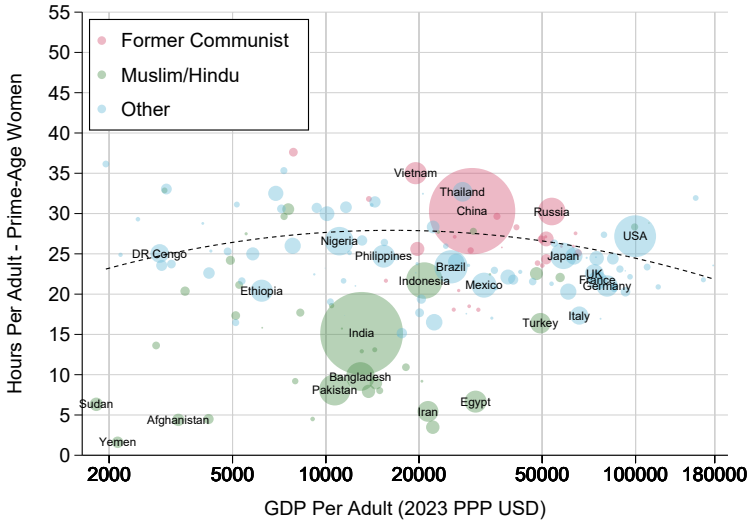
(b) Hours per Worker



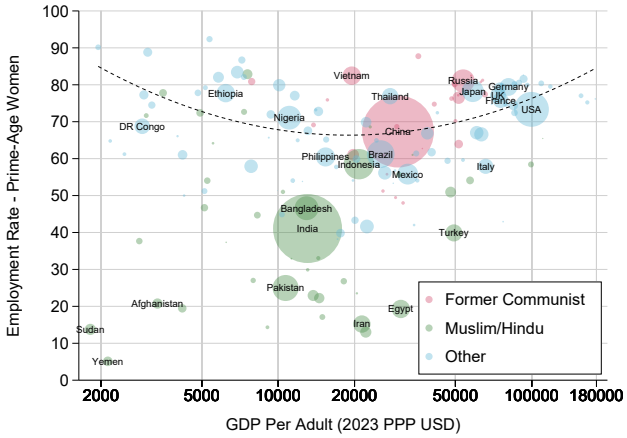
Notes: The figure depicts average hours worked among prime-age women (age 20-59) against GDP per adult in 2023 PPP USD along the extensive and intensive margins (see main text Figure 9(b) for unconditional hours). Panel (a) plots employment rates. Panel (b) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 A.14: Hours of Work of Prime-Age Women: Quadratic Fit Excluding Muslim/Hindu Countries

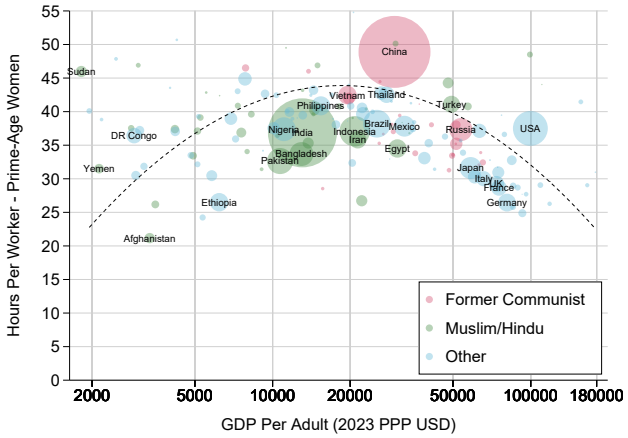
(a) Hours per Adult



(b) Employment Rate



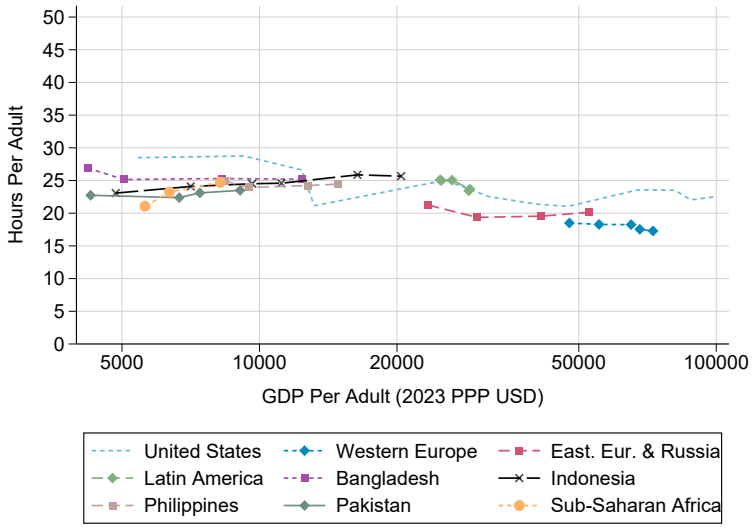
(c) Hours per Worker



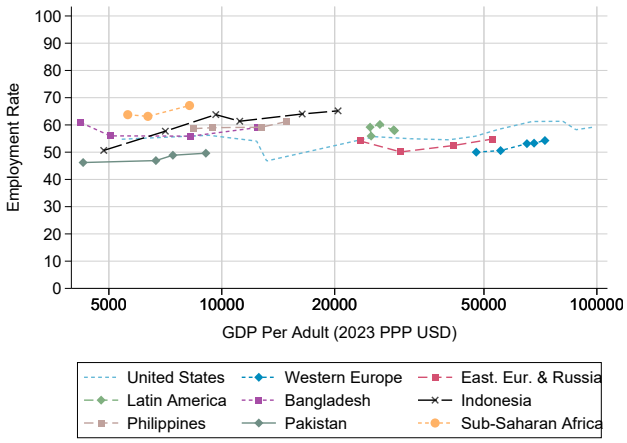
Notes: The figure depicts average hours worked among prime-age women (age 20-59) against GDP per adult in 2023 PPP USD. Panel(a) plots unconditional hours. Panel (b) plots employment rates and Panel (c) plots hours per worker. For each country, we use the most recent labor force survey available (generally 2022-2023 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). 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 9(b), and appendix Figure A.13(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 A.15: Evolution of Hours Worked, All Adults: Extensive vs. Intensive Margins

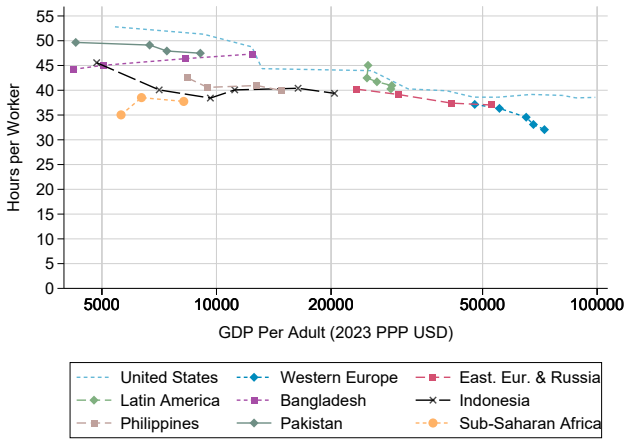
(a) Hours per Adult



(b) Employment Rate



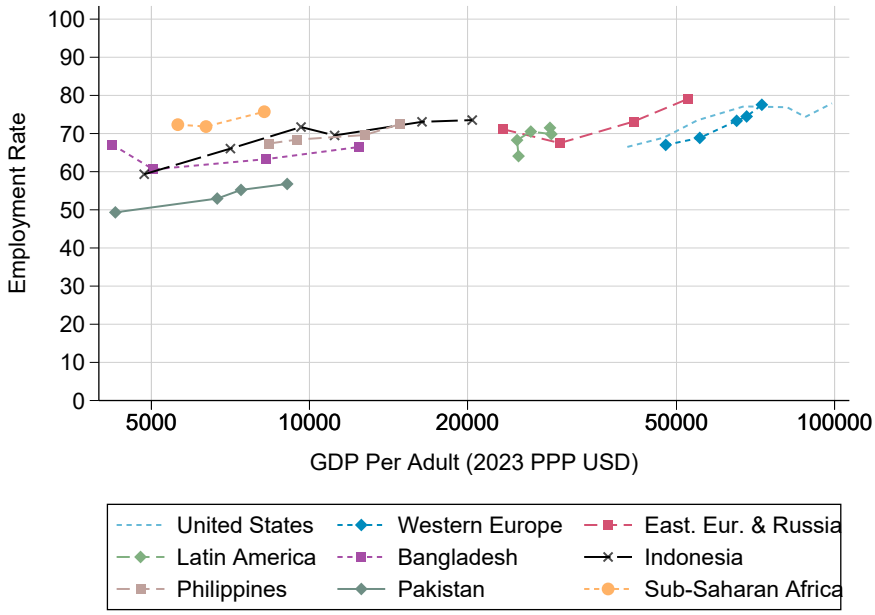
(c) Hours per Worker



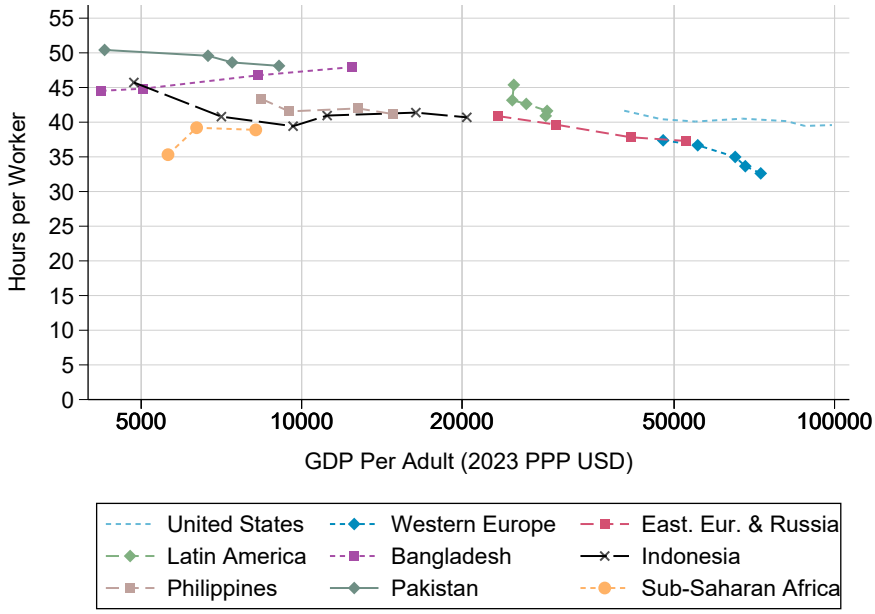
Notes: The figure depicts the evolution by decade of (a) hours per adult, (b) employment rates, and (c) hours per worker among all adults for some regions and countries for which we have long time series (covering 3 decades or more). The estimates are plotted against country or region GDP per adult in 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 A.16: Evolution of Hours Worked, Prime-Age Adults: Extensive vs. Intensive Margins

(a) Employment Rate



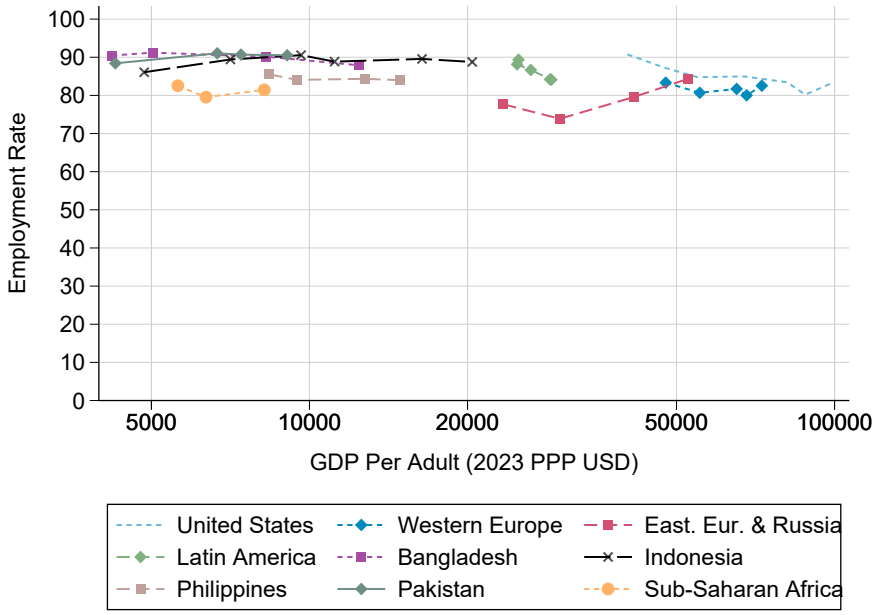
(b) Hours per Worker



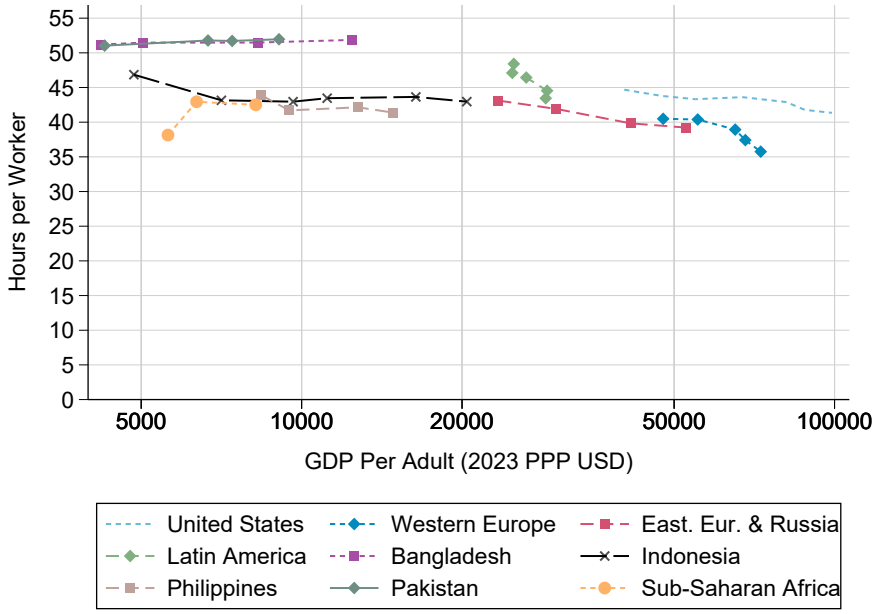
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age adults (see main text Figure 10(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next to last dot is the 2010s, etc. Employment rates for prime-age adults are about stable overtime. Hours per worker tend to be stable for lower income countries/regions and decreasing in richer countries/regions.

Figure A.17: Evolution of Hours Worked, Prime-Age Men: Extensive vs. Intensive Margins

(a) Employment Rate



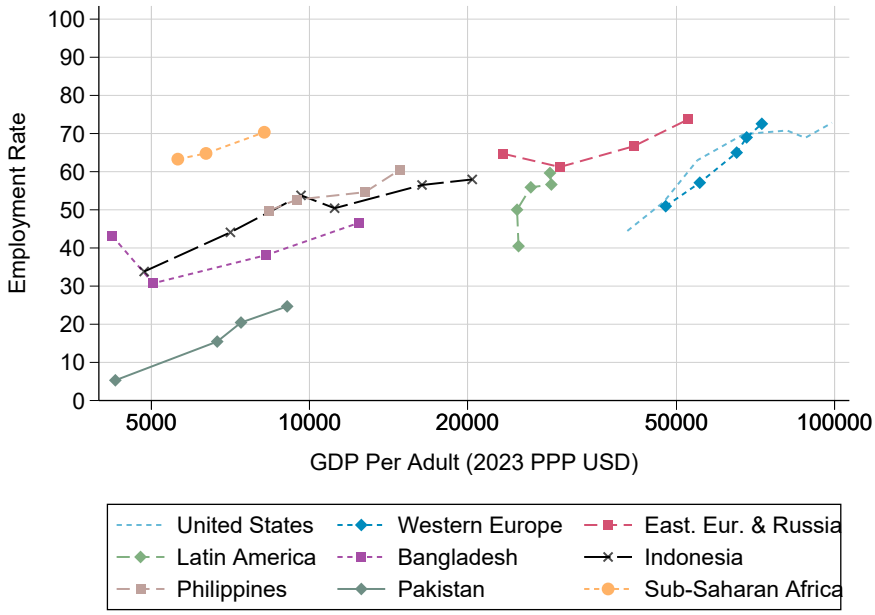
(b) Hours per Worker



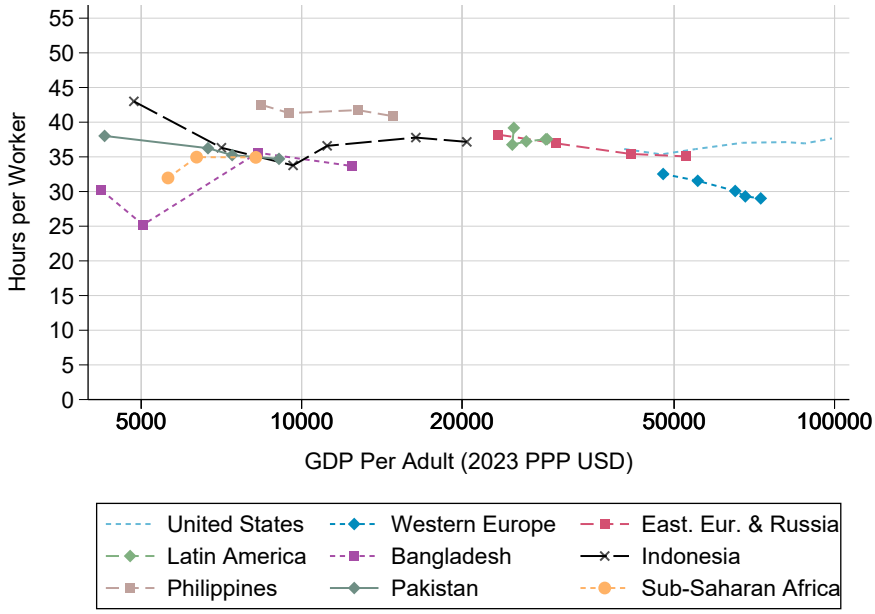
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age men (see main text Figure 10(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next to last dot is the 2010s, etc. Employment rates for 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.

Figure A.18: Evolution of Hours Worked, Prime-Age Women: Extensive vs. Intensive Margins

(a) Employment Rate



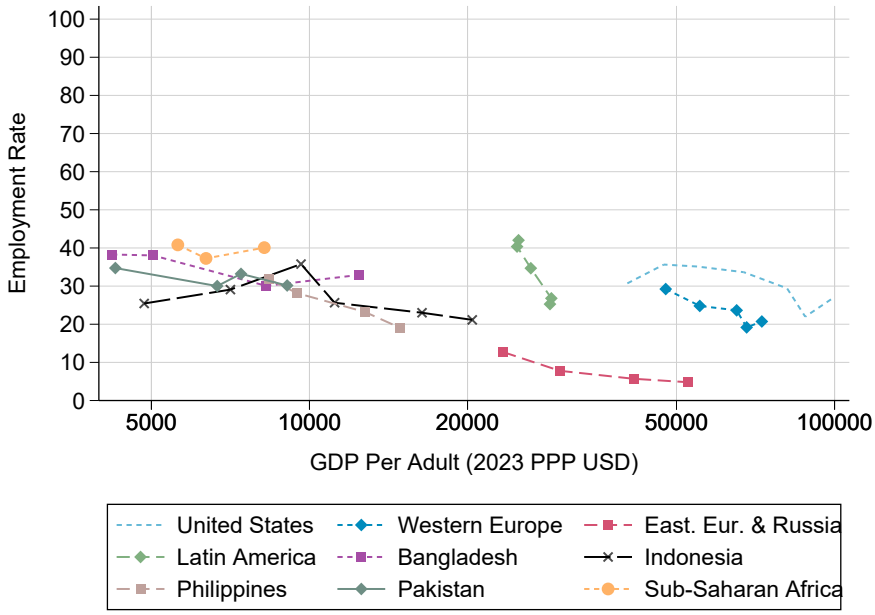
(b) Hours per Worker



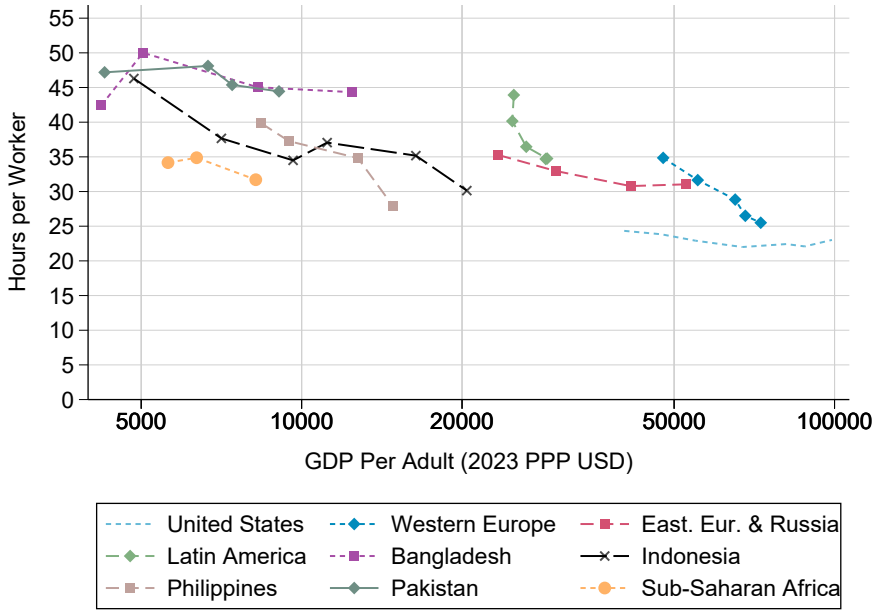
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among prime-age women (see main text Figure 10(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In the series the last dot is the 2020s (excluding COVID years 2020-21), the next to last dot is the 2010s, etc. Employment rates for 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 A.19: Evolution of Hours Worked, Young Adults: Extensive vs. Intensive Margins

(a) Employment Rate



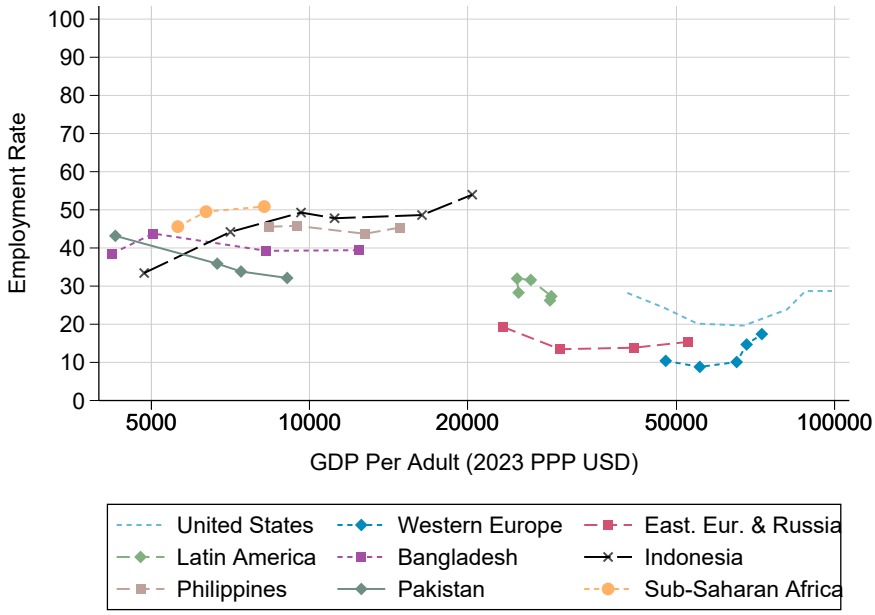
(b) Hours per Worker



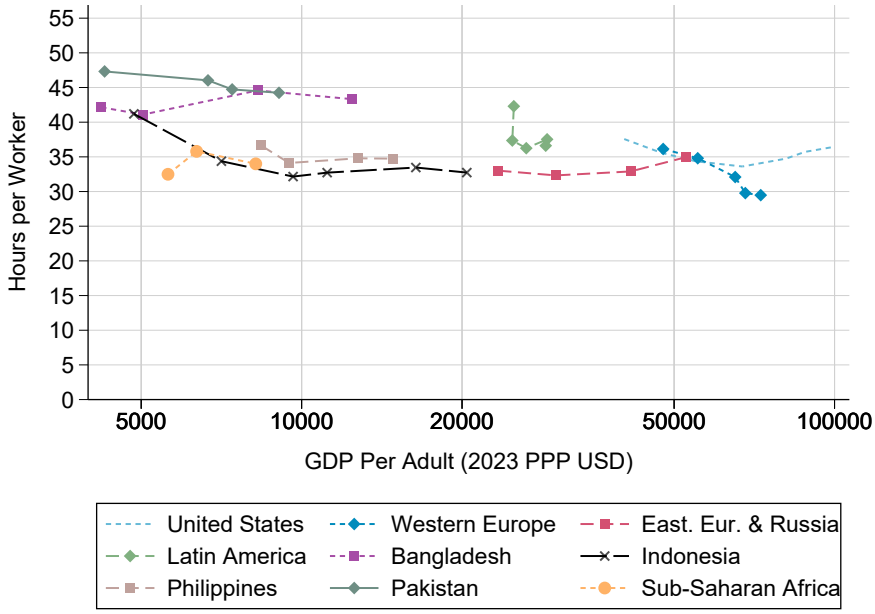
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among young adults aged 15-19 (see main text Figure 11(a) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). 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 A.20: Evolution of Hours Worked, Elderly: Extensive vs. Intensive Margins

(a) Employment Rate



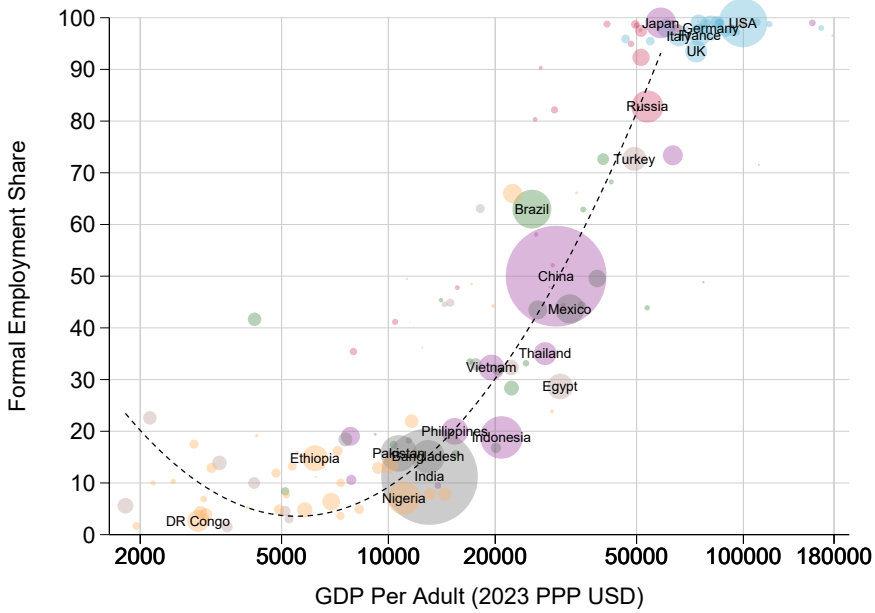
(b) Hours per Worker



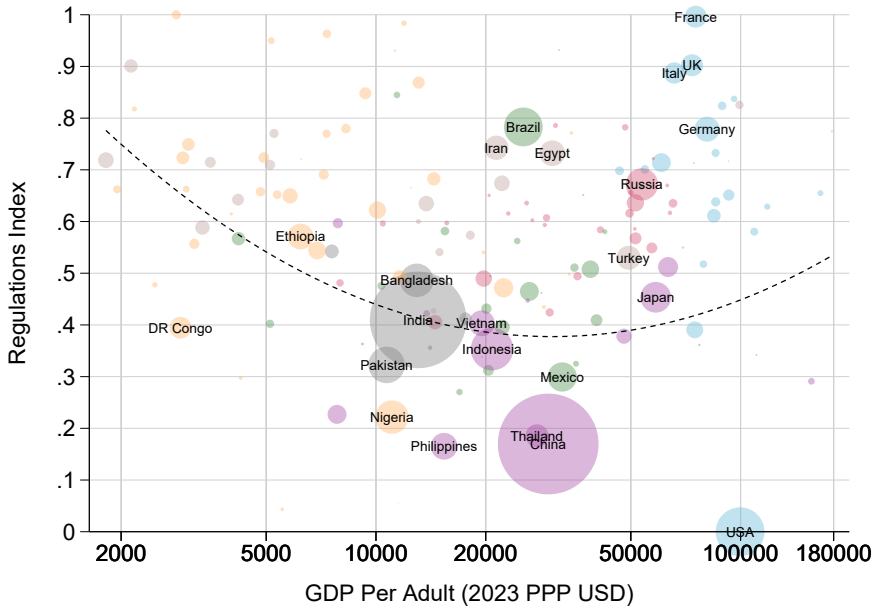
Notes: The figure depicts the evolution by decade of (a) employment rates and (b) hours per worker among the elderly aged 60+ (see main text Figure 11(b) for unconditional hours). Estimates are plotted against country or region GDP per adult in the corresponding period (expressed in 2023 PPP USD). In 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 A.21: Formal Employment and Regulations vs. GDP per adult

(a) Fraction Workers Formal



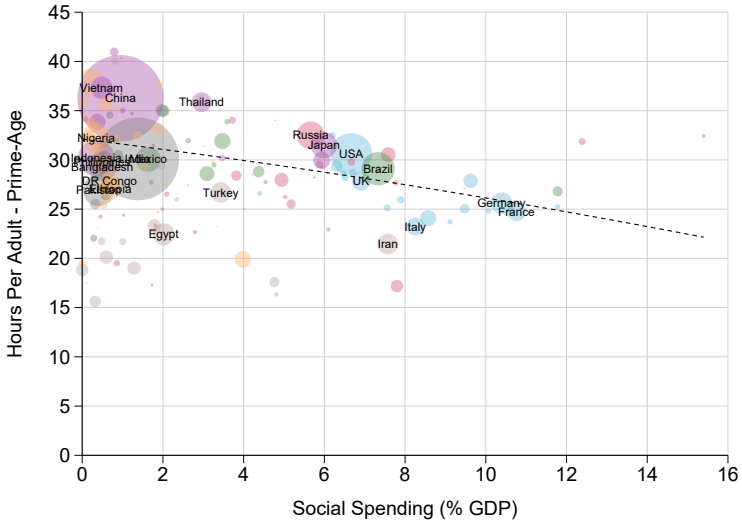
(b) Regulation index



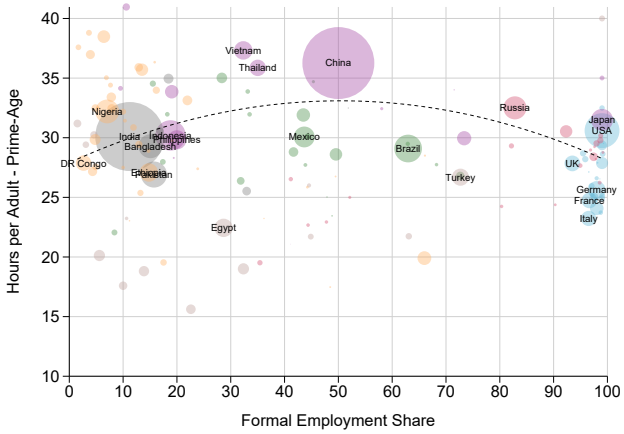
Notes: Panel (a) depicts the fraction of formal workers (among all workers) against GDP per adult in 2023 PPP USD. Panel (b) depicts the working hours regulation index by country created using the working hours regulations variables compiled in the World Bank Employing Workers database. Panel (a) shows 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 A.22: Social Spending, Formality, and Regulations vs. Hours per Prime-Age Adult

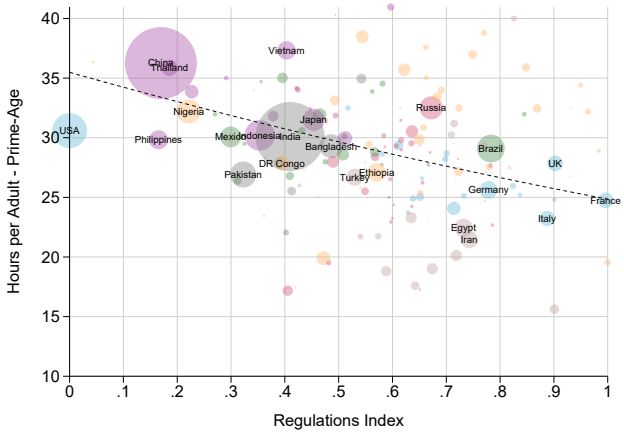
(a) Social Protection Spending relative to GDP



(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 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 A.1: 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	166,152,258	99.4%
Eastern Europe and ex-USSR	28	1991	492	49,823,353	100%
Latin America	24	1971	515	92,766,555	97.2%
East and Southeast Asia	20	1976	247	113,289,775	96.8%
South Asia	6	1973	64	11,507,960	100%
Middle East and North Africa	18	1991	165	36,673,178	85.3%
Sub-Saharan Africa	40	1987	158	10,217,215	98.5%
World	160	1963	2,490	480,430,294	97.3%

Notes. This table describes various features of the new database we have constructed by regions in rows (regions are defined on Figure A.2) 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 A.2: Survey Data Sources

Source	Sample Size	Number of Countries	Number of Surveys	Time Period
I2D2	14,512,691	58	198	1977-2017
GMD	944,662	4	4	2011-2022
GLD	116,780,229	20	246	1981-2022
ILO	209,441,939	103	985	1976-2023
EU-LFS	114,141,576	29	908	1983-2022
Other	24,680,938	24	151	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 Labor Organization labor force survey microdatabase. EU-LFS: European Union Labor Force Surveys. Other: Luxembourg Income Study survey microdata tabulations, IPUMS International census microdata, Life in Transition Survey, and other country-specific microdata sources.

Table A.3: Hours of Work and GDP per Adult (No Population Weight)

Panel A: Cross Section

	(1) All Adults	(2) Prime-Age Adults	(3) Prime-Age Men	(4) Prime-Age Women	(5) Young 15-19	(6) Elderly 60+
Log GDP Per Adult	-1.084***	0.025	-1.084***	0.763	-2.139***	-3.758***
	(0.357)	(0.380)	(0.411)	(0.517)	(0.336)	(0.405)
Mean DepVar	22.7	28.4	35.0	22.2	7.2	12.4
Rich-Poor Gap	-4.3	0.1	-4.3	3.1	-8.6	-15.0
N	160	160	160	160	159	160
Adjusted R2	0.05	-0.01	0.04	0.01	0.20	0.35

Panel B: Panel Data

	(1) All Adults	(2) Prime-Age Adults	(3) Prime-Age Men	(4) Prime-Age Women	(5) Young 15-19	(6) Elderly 60+
Log GDP Per Adult	-0.920***	0.327*	-3.563***	3.968***	-6.978***	0.509***
	(0.163)	(0.176)	(0.245)	(0.187)	(0.248)	(0.156)
Mean DepVar	21.4	27.6	34.8	20.6	7.3	8.4
Rich-Poor Gap	-3.7	1.3	-14.3	15.9	-27.9	2.0
N	2,138	2,138	2,138	2,138	2,115	2,138
Within R2	0.01	0.00	0.09	0.18	0.28	0.00

Notes. This table repeats Table 2 but without weighting countries by population size. It reports regression results linking hours of work per adult and GDP per adult across countries in panel A and within countries and over time in panel B. Each column focuses on a specific group of individuals. All adults: all adults aged 15+. Prime-age: aged 20-59. Elderly: aged 60+. Panel A includes 97% of the world population from 160 countries using the most recent labor force survey available (generally 2022 or 2019 as we exclude COVID years whenever possible, see appendix Table A.9). Panel B includes a subset of 79 countries for which we have longer time series. Regressions in Panel B include country fixed effects. In both panels, each country-year is attributed the same weight.

Table A.4: Hours Worked by the Young (No Population Weight)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	-2.185***		-0.044	1.806***
	(0.334)		(0.335)	(0.394)
Young School Attendance		-23.606***	-23.410***	-20.421***
		(1.792)	(2.332)	(2.083)
Employment: Agriculture				12.732***
				(2.089)
Employment: Manufacturing				-2.851
				(4.106)
Mean DepVar	7.1	7.1	7.1	7.1
N	150	150	150	150
Adjusted R2	0.22	0.54	0.53	0.65

Notes. This table repeats Table 3 but without weighting countries by population size. It reports results from cross-country regressions of average hours of work of the young (aged 15-19) on various determinants. Each country is attributed the same weight. The sample includes 138 countries where all the determinants are available and covers 91% 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).

Table A.5: Hours Worked by the Elderly (No Population Weight)

	(1)	(2)	(3)	(4)	(5)
Log GDP Per Adult	-4.997***			-2.360***	-0.875
	(0.470)			(0.803)	(1.014)
Pension Spending		-72.718***		-63.574***	-48.652***
		(19.643)		(17.502)	(16.994)
Elderly Population Share		-26.571***		4.833	2.573
		(8.395)		(9.957)	(10.019)
Pension Coverage			-14.648***	-5.592***	-2.506
			(1.504)	(1.846)	(1.802)
Employment: Agriculture					12.223***
					(4.240)
Employment: Manufacturing					-11.578
					(7.415)
Mean DepVar	12.0	12.0	12.0	12.0	12.0
N	92	92	92	92	92
Adjusted R2	0.55	0.57	0.51	0.67	0.73

Notes. This table repeats Table 4 but without weighting countries by population size. It reports results from cross-country regressions of average hours of work of the elderly (aged 60+) on various determinants. Each country is attributed the same weight. The sample covers 92 countries for which all the variables are available. It covers 80% 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 pension. 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.

Table A.6: Hours Worked by Prime-Age Women (No Population Weight)

	(1)	(2)	(3)	(4)
Log GDP Per Adult	0.735		-0.938	2.640***
	(0.590)		(0.595)	(0.757)
Muslim/Hindu Share		-10.704***	-11.189***	-9.187***
		(1.366)	(1.393)	(1.257)
Former Communist Country		3.231**	3.370**	4.603***
		(1.311)	(1.307)	(1.293)
% Women Living with Young Children		1.885	-0.608	-2.415
		(2.692)	(3.109)	(2.729)
Employment: Agriculture				19.754***
				(3.823)
Employment: Manufacturing				-13.677
				(8.529)
Mean DepVar	21.8	21.8	21.8	21.8
N	135	135	135	135
Adjusted R2	0.00	0.35	0.35	0.52

Notes. This table repeats Table 5 but without weighting countries by population size. It table reports results from cross-country regressions of average hours of work of prime-age women on various determinants. Each country is attributed the same weight. The sample covers 132 countries for which all the variables are available. It covers 86% 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.

Table A.7: Elasticities of Prime-Age Hours Worked with Respect to Net-of-Tax Rates (No Population Weight)

A. Cross Section

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
$\log 1-\tau(L)$	0.405***	0.518***	-0.117	0.453***	0.460*
	(0.111)	(0.068)	(0.112)	(0.093)	(0.254)
Log GDP Per Adult	0.014	0.015	-0.005	0.008	0.043
	(0.018)	(0.011)	(0.018)	(0.015)	(0.042)
N	138	138	138	138	138
Adjusted R2	0.18	0.49	0.30	0.27	0.35

B. Panel Data

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
$\log 1-\tau(L)$	0.253***	0.108***	0.171***	0.282***	0.247***
	(0.038)	(0.027)	(0.028)	(0.037)	(0.059)
Log GDP Per Adult	0.064***	-0.033***	0.080***	0.118***	-0.019
	(0.011)	(0.008)	(0.008)	(0.011)	(0.017)
N	1937	1937	1937	1937	1937
Adjusted R2	0.85	0.90	0.91	0.88	0.90

Notes. This table repeats Table 6 but without weighting countries by population size. It reports results of regressions linking measures of hours worked for prime-age adults (across columns) on average labor taxes and GDP per adult across countries in panel A and in panel analysis with country fixed effects in panel B. Hours worked are measured in log and tax rates in the log net-of-tax rate so that estimates can all be interpreted as elasticities of hours worked with respect to net-of-tax rates. Regressions are weighted by adult population size in each country to be representative. The sample in panel A covers 126 countries and 92% of the world adult population. In Panel A, we include the Muslim/Hindu population share as it strongly affects female hours of work. In Panel B, we add a time trend to each regression to absorb the secular increase in female hours—and corresponding decrease for men.

Table A.8: Elasticities of Prime-Age Hours Worked: Taxes vs. Transfers and Regulations (No Population Weight)

	Hours Per Adult	Hours Per Worker	Employment Rate	Prime-Age Men	Prime-Age Women
A. Before Controls					
$\log 1-\tau(L)$	0.425***	0.523***	-0.101	0.500***	0.397
	(0.112)	(0.073)	(0.113)	(0.093)	(0.259)
B. Controlling for Social Spending					
$\log 1-\tau(L)$	0.395***	0.467***	-0.054	0.467***	0.331
	(0.131)	(0.085)	(0.133)	(0.109)	(0.304)
Social Protection/GDP	-0.003	-0.005	0.005	-0.003	-0.006
	(0.007)	(0.004)	(0.007)	(0.005)	(0.015)
C. Controlling for Regulations					
$\log 1-\tau(L)$	0.191	0.333***	-0.143	0.164	0.023
	(0.164)	(0.105)	(0.167)	(0.132)	(0.384)
Formal Employment	-0.203*	-0.084	-0.119	-0.301***	-0.333
	(0.106)	(0.068)	(0.108)	(0.085)	(0.247)
Labor Regulations Index	-0.065	-0.143***	0.080	-0.084	-0.097
	(0.082)	(0.053)	(0.084)	(0.066)	(0.191)
D. Controlling for both Social Spending and Regulations					
$\log 1-\tau(L)$	0.193	0.309***	-0.104	0.174	0.015
	(0.170)	(0.109)	(0.172)	(0.136)	(0.397)
N	126	126	126	126	126

Notes. This table repeats Table 7 but without weighting countries by population size. It reports elasticities of prime-age hours worked with respect to the net-of-tax rate on labor income across countries as in Table A.7A and how those elasticities are affected when adding controls for social protection spending (excluding pensions) relative to GDP in Panel B, controls for labor regulations and the share of formal workers in Panel C, and adding both in Panel D. In all these regressions, we also include log GDP per adult and share Muslim/Hindu as in Table A.7, Panel A. 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. This is why coefficients in panel A are slightly different than in Table A.7, Panel A (which included 138 countries). Social protection spending includes all cash and quasi-cash transfers to individuals but excluding public pensions as we focus on prime-age adults (age 20-59). The working regulation index is constructed by combining 12 variables on working hours regulations from the World Bank Employing Workers database.

Table A.9: Data Sources and Coverage of Auxiliary Variables

Country	Source	Survey	Last Survey Year	Hours Worked Reporting	Industry	School Attendance	Household Structure	Pension Coverage	Pension Spending	Tax Rates	Public Spending
Afghanistan	ILO	HIES	2017	Actual	x	x	x			x	x
Albania	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Angola	ILO	LFS	2022	Actual	x	x	x	x	x		x
Argentina	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Armenia	GLD	LFS	2022	Actual	x	x	x	x	x	x	x
Australia	Other	LIS	2018	Usual	x	x	x		x	x	x
Austria	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Azerbaijan	I2D2	AMSSW	2015	Actual	x		x		x	x	x
Bangladesh	GLD	QLFS	2022	Actual	x	x	x	x	x	x	x
Belarus	ILO	LFS	2023	Actual	x	x	x	x		x	x
Belgium	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Belize	ILO	LFS	2019	Actual	x	x	x			x	x
Benin	ILO	HIES	2022	Usual	x	x	x	x	x	x	x
Bhutan	ILO	LFS	2022	Actual	x	x	x	x	x		x
Bolivia	ILO	HIES	2019	Usual	x	x	x	x	x	x	x
Bosnia-Herz.	ILO	LFS	2023	Actual	x	x	x			x	x
Botswana	ILO	HS	2023	Actual	x	x	x	x	x	x	x
Brazil	GLD	PNADC	2022	Actual	x	x	x	x	x	x	x
Brunei D.	ILO	LFS	2023	Actual	x	x	x				x
Bulgaria	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Burkina Faso	ILO	HIES	2022	Usual	x	x		x	x	x	x
Burundi	ILO	HIES	2014	Actual	x	x	x			x	x
Cabo Verde	ILO	LFS	2015	Usual	x	x	x	x	x		x
Cambodia	ILO	LFS	2019	Actual	x	x	x		x	x	x
Cameroon	ILO	HS	2014	Usual	x	x	x	x	x	x	x
Canada	ILO	LFS	2023	Actual	x	x			x	x	x
Cent. Afr. Rep.	I2D2	ECASEB	2008	Actual	x	x	x		x	x	x
Chad	ILO	HIES	2018	Usual	x	x	x	x	x	x	x
Chile	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
China	I2D2	CHIP	2013	Actual	x	x	x	x	x	x	x
Colombia	GMD	GEIH	2022	Actual	x	x	x	x	x	x	x
Comoros	ILO	LFS	2014	Actual	x	x	x	x			x
Costa Rica	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Cote d'Ivoire	ILO	HIES	2022	Usual	x	x	x	x	x	x	x
Croatia	EU-LFS	EU-LFS	2022	Actual	x	x	x	x		x	x
Cyprus	EU-LFS	EU-LFS	2022	Actual	x	x	x	x		x	x

Czech Republic	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
DR Congo	ILO	LFS	2012	Actual	x	x	x	x	x	x	x
Denmark	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Djibouti	I2D2	EDAM	2012	Actual	x	x	x	x			x
Dominican Rep.	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Ecuador	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Egypt	ILO	LFS	2023	Actual	x	x	x		x	x	x
El Salvador	ILO	HS	2023	Actual	x	x	x	x	x	x	x
Estonia	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Ethiopia	GLD	LFS	2013	Actual	x	x	x	x	x	x	x
Finland	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
France	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Gabon	I2D2	EGEP	2017	Actual	x	x	x		x	x	x
Gambia	ILO	LFS	2018	Actual	x	x	x	x	x	x	x
Georgia	GLD	LFS	2022	Actual	x		x	x		x	x
Germany	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Ghana	ILO	HIES	2017	Actual	x	x	x		x	x	x
Greece	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Grenada	ILO	LFS	2023	Actual	x	x					
Guatemala	ILO	LFS	2019	Usual	x	x	x	x	x	x	x
Guinea	I2D2	ELEP	2012	Actual	x	x	x	x		x	x
Guinea-Bissau	ILO	HIES	2022	Usual	x	x			x		x
Guyana	ILO	LFS	2019	Actual	x	x	x			x	x
Haiti	ILO	HIES	2012	Actual	x	x	x	x		x	x
Honduras	ILO	HS	2023	Actual	x	x	x	x	x	x	x
Hungary	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Iceland	EU-LFS	EU-LFS	2022	Actual	x	x		x	x	x	x
India	ILO	LFS	2023	Actual	x	x	x			x	x
Indonesia	ILO	LFS	2023	Actual	x	x		x	x	x	x
Iran	ILO	LFS	2023	Actual	x	x	x		x	x	x
Iraq	ILO	HIES	2012	Actual	x	x	x	x	x		x
Ireland	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Israel	Other	LIS	2019	Usual	x				x	x	x
Italy	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Jamaica	ILO	LFS	2023	Actual	x	x	x		x	x	x
Japan	ILO	LFS	2022	Actual	x				x	x	x
Jordan	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Kazakhstan	Other	LITS	2016	Usual			x	x		x	x
Kenya	ILO	HIES	2016	Actual		x	x	x	x	x	x
Kiribati	ILO	HIES	2023	Actual	x	x					
Korea	ILO	LFS	2023	Actual	x	x			x	x	x
Kosovo	ILO	LFS	2023	Actual	x	x	x		x	x	x
Kyrgyzstan	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Lao PDR	ILO	LFS	2022	Actual	x	x		x	x	x	x
Latvia	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Lebanon	ILO	LFS	2019	Actual	x	x	x		x	x	x

Lesotho	ILO	LFS	2019	Actual	x	x		x	x	x	x
Liberia	ILO	LFS	2010	Actual	x	x	x	x	x	x	x
Lithuania	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Luxembourg	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Macedonia	ILO	LFS	2023	Actual	x	x	x		x	x	x
Madagascar	ILO	LFS	2015	Actual	x	x	x			x	x
Malawi	ILO	LFS	2013	Actual	x	x	x	x	x	x	x
Malaysia	Other	I2D2	2010	Actual	x	x	x		x	x	x
Maldives	ILO	HIES	2019	Actual	x	x	x	x	x		x
Mali	ILO	HIES	2022	Usual	x	x	x	x		x	x
Malta	ILO	LFS	2023	Actual	x	x	x	x	x		x
Mauritania	ILO	HIES	2019	Actual	x	x	x		x	x	x
Mauritius	ILO	LFS	2023	Actual	x	x	x	x		x	x
Mexico	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Moldova	ILO	LFS	2023	Actual	x	x	x	x		x	x
Mongolia	GLD	LFS	2022	Actual	x	x	x	x	x	x	x
Montenegro	ILO	LFS	2023	Actual	x	x	x		x		x
Morocco	GLD	ENE	2018	Actual	x	x	x		x	x	x
Mozambique	ILO	HIES	2022	Actual	x	x	x	x	x	x	x
Myanmar	ILO	LFS	2019	Actual	x	x	x	x	x	x	x
Namibia	ILO	LFS	2018	Actual	x	x	x	x	x	x	x
Nepal	GLD	LFS	2008	Actual	x	x	x	x	x	x	x
Netherlands	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Nicaragua	ILO	HIES	2014	Usual	x	x	x	x	x	x	x
Niger	ILO	HIES	2022	Usual	x	x		x		x	x
Nigeria	ILO	HIES	2019	Actual	x	x	x	x	x	x	x
Norway	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Pakistan	GLD	LFS	2018	Actual	x	x	x	x	x	x	x
Palestine	ILO	LFS	2022	Actual	x	x	x	x	x		x
Panama	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Paraguay	ILO	HS	2023	Actual	x	x	x	x		x	x
Peru	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Philippines	GLD	LFS	2022	Actual	x	x	x	x	x	x	x
Poland	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Portugal	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Rep. Congo	GMD	ECOM	2011	Actual	x	x	x			x	x
Romania	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Russia	ILO	LFS	2023	Actual	x	x	x	x		x	x
Rwanda	I2D2	EICV-V	2016	Actual	x	x	x	x		x	x
Samoa	ILO	LFS	2022	Actual	x	x	x			x	
Sao T. & P.	I2D2	IOF	2017	Usual	x	x	x	x			x
Senegal	ILO	HIES	2022	Usual	x	x		x	x	x	x
Serbia	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Sierra Leone	GLD	LFS	2014	Actual	x	x	x	x		x	x
Singapore	ILO	LFS	2023	Usual	x	x				x	x
Slovakia	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x

Slovenia	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Somalia	Other	HFS	2017	Actual	x	x	x				x
South Africa	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Spain	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Sri Lanka	ILO	LFS	2022	Actual	x	x	x	x	x	x	x
Sudan	ILO	LFS	2022	Actual	x	x	x			x	x
Suriname	ILO	HIES	2016	Actual	x	x	x				x
Swaziland	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Sweden	EU-LFS	EU-LFS	2022	Actual	x	x	x	x	x	x	x
Switzerland	EU-LFS	EU-LFS	2022	Actual	x	x		x	x	x	x
Syria	I2D2	HIES	2003	Actual	x	x	x			x	x
Tajikistan	ILO	LFS	2016	Actual	x	x	x		x		x
Tanzania	ILO	LFS	2014	Actual	x	x				x	x
Thailand	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Timor-Leste	ILO	LFS	2016	Actual	x	x	x			x	x
Togo	ILO	HIES	2022	Usual	x	x		x	x	x	x
Tonga	ILO	LFS	2023	Actual	x	x	x	x			x
Tunisia	ILO	LFS	2019	Actual	x	x	x		x	x	x
Turkey	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
UK	EU-LFS	EU-LFS	2019	Actual	x		x	x	x	x	x
USA	Other	CPS	2023	Actual	x	x	x	x	x	x	x
Uganda	ILO	HIES	2019	Actual	x	x	x	x	x	x	x
Ukraine	Other	LITS	2016	Usual			x		x	x	x
UAE	ILO	LFS	2023	Actual	x	x					x
Uruguay	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Uzbekistan	Other	LITS	2016	Usual			x		x	x	x
Vanuatu	ILO	HIES	2019	Actual	x	x	x				
Venezuela	ILO	LFS	2017	Actual	x	x	x			x	x
Vietnam	ILO	LFS	2023	Actual	x	x	x	x	x	x	x
Yemen	ILO	LFS	2014	Actual	x	x	x	x		x	x
Zambia	GLD	LFS	2012	Actual	x		x	x	x	x	x
Zimbabwe	GLD	LFS	2011	Actual	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. 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, 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, LFS = Labor Force Survey, LIS = Luxembourg Income Study, LITS = Life in Transition Survey, PNADC = Continuous National Household Sample Survey, QLFS = Quarterly Labor Force 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. (2022). Public spending variables are from Gethin (2024).