The Gender Division of Work across Countries

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Abstract

Across countries, women and men allocate time differently between market work, domestic services, and care work. In this paper, we document the gender division of work, drawing on two new harmonized data sets that provide high-quality observations on time use and wages for many countries, spanning the global income distribution. We show that the gender division of work varies widely across countries – even when comparing countries at similar income levels. To understand this variation, we formulate a macroeconomic model of household time use in which country-level allocations are shaped by wages and a set of "wedges" that reflect productivity differentials, preferences, and disutilities. Taking the model to country-level observations, we find that a gender wedge related to the disutility of market work for women plays a crucial role in generating the observed dispersion of outcomes, particularly for middle-income countries. This wedge is highly correlated with norms and gender-biased laws. By contrast, gender wage gaps explain little of the cross-country variation in patterns of work, although our analysis supports previous work showing that these have been important historically in the United States. We also find little role of gender-neutral factors such as changes in home technologies or the cost of substitutes.

1 Introduction

As Adam Smith observed some 250 years ago, the productivity of an economy depends in large measure on the division of labor. Societies differ in the ways in which they divide work, with consequent effects for individual and collective well-being. What "useful labour" (to borrow a term from Smith) is done in an economy? Who performs this labor? How does the allocation of labor across individuals relate to the productivity of the economy? How do social structures, norms, and policies alter the division of labor?

For this paper, we construct two new country-level data sets and use them in conjunction with a macro model to examine the division of work across different economies. Our goal is to

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understand how economic growth and social choices combine to shape the ways in which work is divided between men and women, and between home and market. [1]

We begin by documenting that the division of work varies enormously across countries. For example, in 2021, married women in the United States on average worked 25.5 hours per week in the market, 65% as many hours as married men. In India, by contrast, married women performed only 12 hours of market work per week on average, 23% as many as married men. Both cases differ from the pattern observed in China, where married women, on average, worked 33 hours per week in the market (72% as many as married men). These differences are accompanied by large differences in non-market work, which accounted for 33 hours per week for married women in the US (56 percent more than for married men), 47 hours in India (eight times the level for married men), and 28 hours in China (about three times the level for married men).[2]

What accounts for the different patterns across countries? Is there a "natural" progression in the gender division of work that correlates closely to levels of income per capita – and perhaps sectoral or structural changes in economies? How much of the cross-country variation in work can be attributed to differences in income per capita? To what extent do social choices, policies, and deep institutional structures play a role in shaping gendered patterns of work?

To address these questions, we construct and analyze two data sets. The first harmonizes high-quality time-use data from 77 nationally representative surveys covering 7.4 million individual diaries across 50 countries, spanning the global income distribution. The data allow us to observe both market and non-market work in detail. Within non-market work, we further distinguish domestic services and care work. The second data set consolidates and harmonizes labor market modules from 70 labor force and household surveys; we use these data primarily to measure market wage rates for women and men. For both data sets, we apply rigorous sample inclusion criteria. Our measures of work are based on national accounts conventions and thus allow us to measure different types of work in consistent ways.

These data sets show clearly that patterns of work differ strikingly across countries and over time. Perhaps more surprising, patterns of work also differ substantially for economies at similar levels of income. We interpret this as evidence that social and political choices play a powerful role in shaping the gender division of work. Although income growth clearly affects the division of work, it accounts for only a fraction of the observed variation.

Drawing on this descriptive analysis, we construct a new model in which couples choose how to allocate their time across market work, domestic services, and care work.[3] The model delivers tractable expressions that allow us to invert the model and back out its parameters directly from data. We use the model to understand differences across countries in the gender division of work. We further examine changes over time within Tanzania, India, France, Korea and the United States. For both the cross-section and time series analyses, the model allows us to attribute these patterns to country-specific "gaps" and "wedges" that can be understood as summarizing a range of costs and barriers that shape time allocation.

First, we recognize that men and women experience different market returns to labor. This widely studied "gender wage gap" is observed directly in our data set of labor force surveys. In the model, the gender wage gap affects the gender division of both market and non-market work.

Second, we model men and women within a given country as having identical utility from

[1] Because our study encompasses both market and non-market activities, and because both of these may be paid or unpaid, we use the term "work" to embrace a broad set of non-leisure activities. Following national income accounting conventions, we view "market" activities as those that produce goods or services that would fall inside the national accounts boundary (United Nations, 2008, §§ 1.40-1.42). These may involve work that is paid (e.g., wage work) or unpaid (e.g., subsistence agriculture). We define non-market work as work activities that fall outside the national accounts boundary.

[2] Authors' calculations using sources and samples discussed below.

[3] In what follows, we sometimes use the term "activities" to denote the set of three work types.

consumption of market and non-market goods and services. Across countries, however, there may be differences in how these goods and services are valued. To capture country-specific differences, we allow for "activity wedges" that are gender-neutral but that may still affect the gender division of work due to the interdependence of work choices. These wedges reflect factors like cross-country differences in preferences (e.g. due to differences in fertility), in home productivity (e.g. due to appliances), or in the cost of substitutes (e.g. for daycare). While gender-neutral, these wedges still affect the gender division of work in the presence of other gender imbalances, e.g. in wages, because of the interaction of choices within the household.

Third, we model a "gender wedge" in the disutility of each type of work. These wedges reflect the fact that men and women differently derive disutility from the same activity. They capture imbalances in the division of each type of work that cannot be attributed to wages or to time devoted to other activities. Conceptually, the gender wedges capture any variation between men and women in the disutility of particular types of work (or the work environment); they also capture social norms that alter or shape the utility that men and women attach to specific types of work.

Our model can be matched to data in a straightforward way. Each of the wedges in our model generates a distinct signature in the time-use data, allowing us to identify the gender wedges separately from the activity wedges or wage gaps. To do this, it is essential that we can observe wages and time use for both men and women. In a nutshell, non-market work by men is needed to identify separately the gender-specific factors driving women's time allocation. For example, if women are observed working many non-market hours, this could be consistent with an activity wedge that affects both men and women (e.g., the need to produce child care at home). But if we also observe that men work *few* non-market hours, then we can conclude that there are important gender-specific components (i.e., gender wedges).

We analyze the different wedges we find to see how they vary across time and country. From this analysis, we find that gender wedges vary widely across countries for all types of work. On average, the relative disutility of market work for women is large, similar in magnitude to what we would find if women's market earnings were taxed 70% more than men's earnings. This gender wedge displays enormous variation, particularly among middle-income countries. Gender wedges in non-market work are also large, especially for some low- and middle-income countries; in these countries, men seem to derive a high (relative) disutility from non-market work. All three gender wedges are smallest in high-income countries.

Using the calibrated model, we then conduct a series of counterfactual experiments. We show that social choices, as represented by gender wedges, have quantitatively large effects on the gender division of work. In particular, we find that the gender wedges that we measure play a central role in suppressing women's market work, accounting for around 60% of the observed variation in the gender division of work. By contrast, gender wage gaps play a minor role in shaping patterns of work across countries. This is similar for the gender-neutral activity wedges, which are systematically higher in richer countries and only weakly related to the gender division of work.

We next ask which factors contribute to the changes within countries over time. We undertake this exercise for five countries that span a wide range of income per capita: Tanzania, India, Korea, France, and the United States. For each of these countries, we carry out a decomposition exercise to quantify the contribution of each wedge and gap in accounting for the observed changes over time in the gender division of work. We find substantial heterogeneity in country experiences. In the United States, a declining gender wage gap played a crucial role in the rise of women's market work. But this mechanism does not seem to have been important everywhere. In India, although the gender wage gap fell over time, women's market work declined, suggesting that non-wage factors played an important role.

What exactly are these non-wage factors? Each wedge can be understood as a summary representation of various real-world counterparts. Many policies and structural barriers can be

mapped into the vocabulary of wedges. Our wedges can be used to represent such features of the real world as socially constructed views of gender roles or harassment on the job (captured by the gender wedges) or the limited availability of child care (captured by an activity wedge). Our findings on the relative importance of different wedges point to the types of real-world features that are quantitatively important determinants of the gender division of work.

It is reassuring that we find values for the gender wedges that are broadly consistent with other evidence on gender outcomes and attitudes across countries and time. We find strong correlations between our measured wedges and gender-biased laws, values regarding jobs and politics, and the religious composition of countries. Our wedges seem – perhaps unsurprisingly – to be largest in societies with the least gender equality. This gives us confidence that our analysis is capturing relevant variation across countries.

Our key message is that non-wage factors appear to play a particularly salient role in determining the gender division of both market and home work. While reductions in gender wage gaps were crucial to the changes that took place in the United States over the past sixty years, for much of the rest of the world, it is non-wage factors – and in particular gender wedges – that carry the greatest weight. Understanding those factors better – and finding ways to influence them – may present both challenges and opportunities for policy.

The remainder of this paper is structured as follows. In Section 2, we map our contribution relative to other literature. Section 3 then describes the two new data sets that form the basis of our analysis, and section 4 documents a series of facts that emerge from the time use data. Section 5 introduces a theoretical framework that we use to interpret the data. In section 6, we report the results of a set of counterfactual exercises. Section 7 concludes and reflects on the policy implications of the research.

2 Literature

Our paper builds on a substantial body of literature that highlights the importance of considering gender in macroeconomic analysis. Clearly, the work of Claudia Goldin (e.g., 1991, 1995, 2000) has played a central role in this literature, calling attention to large and consequential changes in women's labor force participation and hours worked in recent decades, primarily in the United States.

Other researchers have also investigated changes over time in the United States in market work, non-market work and leisure (e.g., Aguiar and Hurst (2007) and Ramey and Francis (2009)). A recent paper by Ngai et al. (2024) addresses the same issue for a longer historical sweep. Across a larger set of countries, Bick et al. (2018) construct a harmonized data set that characterizes patterns of market labor and touches briefly (for a more limited set of countries) on hours devoted to what they term "home services". Similarly, Bridgman et al. (2018) draw on time-use data to compare patterns of work across countries. Boppart and Krusell (2020) show that market hours have declined over time in a set of 14 high-income countries, with the United States seemingly exceptional in showing little or no decline in hours. For low-income countries, Dinkelman and Ngai (2022) document patterns of women's time use for six African countries. Relative to this research, our contribution is to present new data with broader coverage, consistent definitions, and high quality standards for sample inclusion. We also use definitions of work that are directly based on national accounts conventions.

In both cross-country and time series data, researchers have often focused on what is described as a U-shaped pattern of women's labor force participation in relation to income per capita, beginning with the seminal work of Sinha (1965) and the key contribution of Goldin (1995). Goldin's work drew on historical observations from the United States, combined with aggregate cross-section observations for a number of low-income countries. Ngai et al. (2024) also find support for the U-shape in U.S. historical data, going back to the 19th century. Similar results have been found for Korea (Lee et al., 2008) and China (Hare, 2016). In broader

cross-country analysis, Mammen and Paxson (2000) identified a U-shape in their multi-country panel. However, other researchers (e.g., Gaddis and Klasen (2014) and Klasen (2019)) have argued that the U-shape is primarily a feature of the cross-section data and that income growth within many countries shows little evidence of a U.

These observations have given rise to a branch of literature in which authors seek to theorize or explain part or all of the U-shape. For instance, Ngai and Petrongolo (2017) introduce a framework that generates the upward-sloping portion of the U-shape in relatively rich countries; more recent work by Ngai et al. (2024) aims to capture the downward-sloping part of the U as well. A recent paper by Chiplunkar and Kleineberg (2022) similarly aims to match the U-shape. All three of these papers view sectoral movements as key to understanding the U-shape, with agriculture and services offering more opportunities for women to engage in market labor than manufacturing, and with market services substituting for women's labor in the home.

Broadly speaking, our cross-country findings are consistent with these studies. We find evidence of a weak U-shaped pattern in the cross-section. At the same time, our wide country coverage allows us to go further. Our data clearly reveal that patterns of work differ strongly *across countries at similar levels of income*. This motivates our view that income per capita has limited power to explain the gendered patterns of work that we observe across countries. We suggest that a richer framework is needed to account for the striking dispersion in the gender division of work across countries.

Our theoretical approach builds on a literature that looks at women's market labor through the lens of models that explicitly incorporate home production (Becker, 1965; Gronau, 1977). In the macro literature, Benhabib et al. (1991) and Greenwood et al. (1995) pioneered the inclusion of home work in macro and growth models. Subsequent work (e.g., Greenwood et al., 2005; Rogerson, 2009; Ngai and Pissarides, 2008; Ngai and Petrongolo, 2017; Gollin et al., 2004; Olovsson, 2009; Ragan, 2013) identified the home sector as an important locus of production in the economy, absorbing some of the economy's labor and producing outputs that substitute for market goods. As this literature pointed out (e.g., Rendall (2018), Buera and Kaboski (2012)), growth and structural transformation may alter the role of the home sector and may thus affect women's labor market participation.

Our modeling of household preferences builds on this literature, particularly on Boerma and Karabarbounis (2021) (henceforth BK21), who focus on the role of home production in understanding inequality across US households. We extend this approach to model the labor allocation decisions of couples and also explicitly allow for the disutility of different types of work to interact; i.e., we do not impose additive separability.

Previous literature has tended to assume that the processes of growth and structural change lead, in a causal sense, to changes in the division of activity between home and market. We suggest that the relationship is more complex. To the extent that policies, norms, and social factors place constraints or costs on the reallocation of labor within an economy, it may be that the processes of growth and structural change are themselves limited by the gaps and wedges that we document. In this sense, we build on the work of Hsieh et al. (2019), who show that wedges – similar to the ones in our model – shaped the (mis)allocation of market labor in the United States. The wedges approach more broadly has a long tradition in macroeconomics, tracing back at least to Chari et al. (2007).

Our work also relates to the much broader set of literature on gender as an analytical category in many facets of labor markets. We cannot hope to review this adequately within our paper; fortunately, a forthcoming review paper by Olivetti et al. (2024) will take up this challenge. Similarly, our paper touches on literatures in family economics (e.g., as surveyed by Doepke and Tertilt (2016)), feminist economics (e.g., Folbre (2024) on care work), and gender norms and development (Jayachandran, 2021; Bursztyn et al., 2020). These literatures have together informed the structure of our analysis by leading us to include care work explicitly and

to consider the role of gender norms in shaping the division of work across countries.[4]

3 Data and Measurement

Our paper uses two new data sets that we created through careful curation and harmonization of existing secondary sources. This section discusses the data sources, the criteria used in constructing our data sets, and our choices in defining and measuring market and non-market hours and hourly wages.

3.1 Data Sources

The first of our data sets focuses on the time use of men and women across a large set of countries. We use nationally representative time-use surveys with diaries containing information on activities conducted over the course of a full day. These diaries measure hours spent across various activities, including non-market work, which typically is not fully measured in labor force and household surveys.

All surveys we use satisfy the following three criteria: they are (i) nationally representative, (ii) provide consistent 24-hour diary information, and (iii) allow for a clear delineation of work into hours spent on market work, care, and domestic services.[5] To ensure (iii), we only use surveys that provide time spent on at least 26 activities.

Our dataset contains 77 surveys that satisfy these criteria, covering 50 countries. It encompasses previously harmonized cross-country datasets such as the Harmonized European Time Use Survey (HETUS) and the Centre for Time Use Research (CTUR) dataset.[6] Relative to these, our dataset covers many more countries, which are mostly non-western and low-income countries.

Our sample covers 7.4 million diaries of people across all continents in countries that span the income-per-capita distribution from USD PPP 1'255 (Ethiopia 2013) to 103'436 (Luxembourg 2014). Our empirical analysis uses these datasets to study hours worked across 50 countries and over time for five countries, namely Tanzania, India, Korea, France, and the U.S. Table 7 lists the surveys we use.[7]

To measure hourly wages by gender, we create a second data set using household and labor force surveys. We do this since time-use surveys rarely measure wages; if they do, they rely on much smaller sample sizes than household or labor force surveys. These datasets are matched as closely as possible to the country-year observations in the time-use datasets, so we have hourly wage measurements by gender for 47 countries, as well as the five countries we study over time.[8]

[4]Our work also connects with a large and growing literature on gender and labor markets. Our thinking has been influenced by the literature on gendered labor market impacts arising from cultural factors (Fernández et al., 2004; Fernández, 2013; Bursztyn et al., 2020; Fogli and Veldkamp, 2011), institutions (Chiappori et al., 2002; Knowles, 2013; Greenwood et al., 2016), and labor market discrimination (Hsieh et al., 2019; Chiplunkar and Kleineberg, 2022). Our work also relates to research on the occupational sorting of mothers (Adda et al., 2017), the amount of time devoted to care work (Agostinelli and Sorrenti, 2022), and the tendency of women to specialize in home production (Doepke and Tertilt, 2019).

[5]Using 24-hour diary data is considered the best practice in the time-use literature. Many time-use surveys do not satisfy this criterion, for example many time-use surveys conducted in Latin America. In those surveys, the total recorded time use often deviates significantly from 24 hours due to recall bias. We only use surveys in which time spent on primary activities sums to 24 hours. This approach distinguishes our work from previous efforts to compare time use across countries (Bridgman et al., 2018; Bick et al., 2018).

[6]The Multinational Time Use Survey (MTUS) data is another harmonized time-use dataset used in the literature. The CTUR dataset encompasses all datasets from the MTUS.

[7]A limitation is that we have only the primary activity of individuals, because surveys differ greatly in whether (and how) they report secondary activities, making harmonization infeasible. This may understate the amount of domestic services and care work being provided by women.

[8]For Bangladesh, Turkey, and Morocco, we do not have wage measurements. These three countries, therefore, are included in the empirical analysis in Section 4, but not in the later quantitative analysis.

Table 8 lists the labor force and household surveys we use.

All the labor force and household surveys we draw from are i) nationally representative, ii) contain data on hours worked and wages, and iii) are conducted close in time to the time-use survey we use for each this particular country.[9] Given our focus, we use the subsample of married men and married women for our analysis.

3.2 Definition of Work and Activity Classification

The categories of market work, care work, and domestic services are conceptually distinct. Since different activity classifications are used across countries, the main challenge is to measure these activities consistently. Our approach relies on classifying activities according to two rules, which have a long tradition in economics and national accounts statistics.

First, we define work as any activity that satisfies the third-person criterion, i.e., an activity for "*which one person may be hired to perform for another*" (Marshall and Marshall, 1879); see also Reid (1934). This implies that child care and domestic services such as cooking, cleaning, or preparing tax returns are considered work, while personal care, religious activities, and education – or leisure activities like sports, the consumption of culture, or reading – are not.

Second, to distinguish market and non-market work, we follow the production boundary defined by the System of National Accounts (United Nations, 2008, §§ 1.40-1.42). This defines market activities as those that produce goods or market services.[10] This includes goods produced for own use or barter and notably implies the classification of subsistence agriculture as market work. It implies that services produced for own use be classified as non-market work. This is in line with the literature that studies structural change across countries (Gollin et al., 2014) and over time (Ngai et al., 2024).[11] [12] [13]

Finally, within non-market work activities, we distinguish between domestic services and care work. The former category encompasses any time spent producing domestic services for own final use, such as food preparation, household chores, and shopping for the household. This is distinct from care work, which we define as any time spent producing care services for household and family members. Our measure of care work also includes the (quantitatively small) time spent doing volunteer work, pursuing civic duties, and related activities for the community. A recent literature has deeply explored the many nuanced understandings of care work; for an excellent review, see Folbre (2024).[14]

Our approach is summarized in Table 1. The rules we use to classify activities are aligned with the 2016 International Classification of Activities for Time-Use Statistics (ICATUS) established by the United Nations Statistics Division (United Nations, 2021). This classification has been purposely designed to capture activities conducted in countries at all stages of devel-

[9] We make an exception for Argentina 2019, where we use the Encuesta Permanent de los Hogares (EPH), which is only representative of urban areas.

[10] The key principle used to differentiate between goods and services is whether the decision to consume and produce can be separated. For services, the decision to produce entails a simultaneous decision to consume that service (United Nations, 2008, §6.29). This is not the case for goods.

[11] For example, our rules clearly define activities such as collecting wood and fetching water as market work (see ICLS, 2013, §22.b.ii). In some other studies (e.g., Bick et al., 2018 and Bridgman et al., 2018), these activities have been treated as home production and/or non-market work. Time spent collecting water and firewood amounts to 1.4 hours per week in low-income countries and 0.7 hours in middle-income countries.

[12] Time spent on ancillary work activities, such as transport, counts towards time worked, in line with ICATUS 2016. In the context of market work, ancillary activities such as commuting, meals, breaks at work, and job search are included as work. Similarly, commuting for groceries is included in domestic services. Our measures of market hours are correspondingly higher than those typically recorded using household and labor force surveys. The patterns we document below are not sensitive to including commuting and job search in market work.

[13] We note to the extent that the historical definition of the market boundary excluded many activities typically done by women, it is unsurprising to find in the data that women disproportionately engage in non-market work.

[14] Recent scholarship calls attention to the particular complexities in substituting market alternatives for care work (Folbre, 2024; Moos, 2021).

opment.[15] Our definitions of market work correspond to ICATUS2016 1-digit codes 1 and 2, domestic services to code 3, and care work to codes 4 and 5.

Table 1: Definition of types of work and mapping into the International Classification of Activities for Time-Use Statistics (ICATUS).

Activity	Type of work	Definition	ICATUS (1d code)	System of National Account Boundary
Work		*Activities that can be delegated to a third party (Marshall; Reid)*		
	Market work	Production of goods and services destined to the market	1	Yes
		Production of goods for own final use	2	Yes
		Production of services for own final use (non-market work)		
	Domestic services		3	No
	Care work	Household and family members	4	No
		Others (incl. volunteering and community work)	5	No
Non-work activities		Education, Leisure and Self-care	6-9	

3.3 Measurement

From the time use diaries, we compute average hours worked per day of the week for each country-year survey and aggregate these to hours worked per week using diary survey weights.[16] For consistency with our model, we focus on married working-age men and women (age 15-65).

We use labor force and household surveys to measure hourly wages. The surveys report data for a reference period. We use labor income in the main job during the reference period, along with the corresponding hours worked.[17] We scale these data to produce measures of hourly wages for married working-age men and women. We then use exchange rates and IMF data on Consumer Price Indices to convert them into 2010 US dollars. Our gender wage gap measures are consistent with those measured for OECD countries by Olivetti and Petrongolo (2008), and in the US by Heathcote et al. (2023). We extend this measurement to 47 countries.

4 The Gender Division of Work across Countries

In this section, we establish novel empirical facts on how average hours worked in market, domestic services, and care activities for married men and women vary across 50 countries and over time for five countries.

4.1 Market work and country income per capita

We begin by discussing patterns of market work. Figure 1 shows that for married men, hours in market work strongly decline with country income levels, from 46.9 hours a week in low-income countries to 38.2 hours in high-income countries. The elasticity of men's market hours with respect to GDP per capita is -0.07, and is statistically significantly different from zero (column 5, Table 2). [18]

[15] Other countries and agencies use different activity classifications. For instance, EUROSTAT uses the Activity Coding List (ACL), Latin American countries use the Classification of Time-Use Activities for Latin America and the Caribbean (CAUTAL), and the US Bureau of Labor Statistics the Activity Coding Lexicon.

[16] When these are unavailable, we use individual survey weights. For very few surveys, weights are not provided, and we weigh weekdays and weekend days by 5/7 and 2/7, respectively.

[17] Some surveys report both actual hours/income and "usual" hours worked; where both are available, we give preference to the actual.

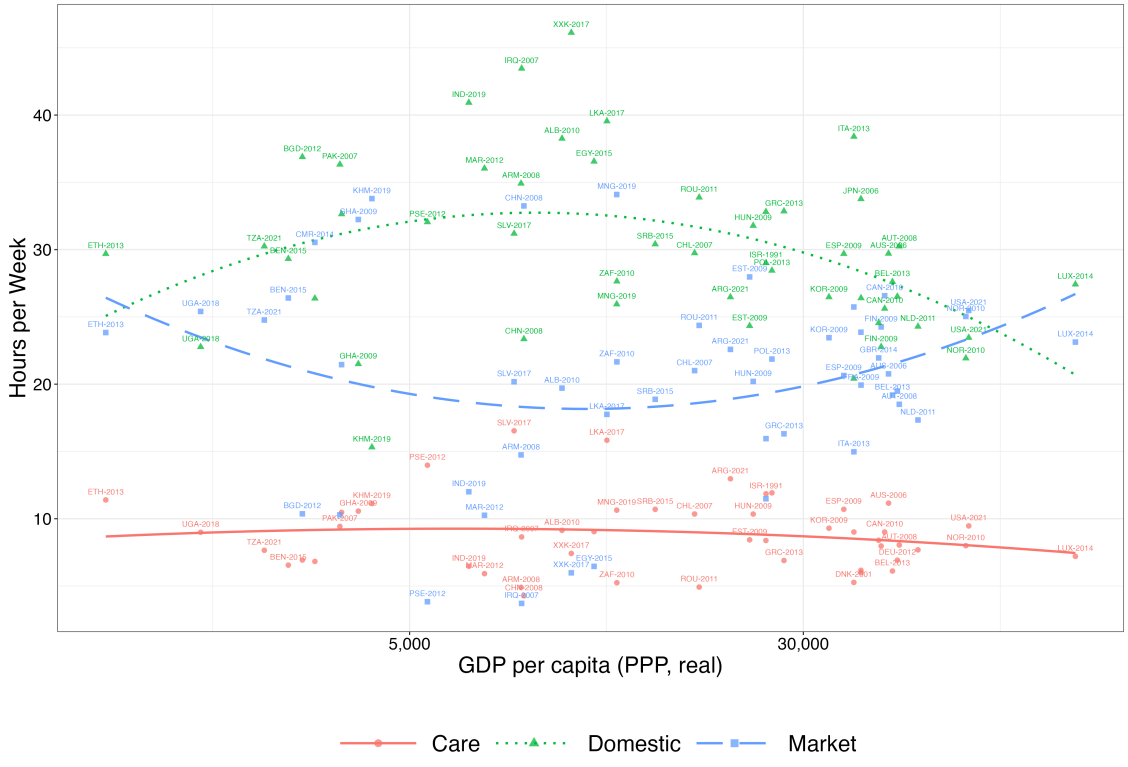
[18] This gradient of hours is close to that found by Bick et al. (2018) using data from labor force surveys. They find lower level of market hours because their sample includes singles and people over the age of 65, who work significantly less than the married adults we focus on.

Market work by women is also lower in high-income compared to low-income countries, at an average of 21.8 hours a week compared to 23.9. However, middle-income countries do not conform to this pattern, with a mere 17.5 average weekly hours of market work. This implies a (weak) U-shape in market hours worked by women in the cross-section of countries, consistent with earlier findings by Sinha (1965); Goldin (1995), and others. However, dispersion around the fitted line is extremely high in middle-income countries.

Our time use data thus track closely with patterns of market work documented in previous studies using different data sources. At the same time, our work goes significantly beyond earlier work on market hours worked by women, which mostly used aggregate data from the ILO or the United Nations (see also Olivetti (2014)).



(a) Married Men



(b) Married Women

Figure 1: **Weekly Hours Worked.** Each dot shows average weekly hours worked for married individuals aged 15-64 for a country survey, plotted against country GDP per capita (PPP) from Feenstra et al. (2015) for the corresponding year. Panel (a) features linear lines of best fit. Panel (b) features quadratic lines of best fits.

Table 2: Average Hours Worked of Married Working-age Individuals.

		Country Income Group			All countries	
Work type		LIC	MIC	HIC	Mean	$\varepsilon(\text{hours}, \ln y)$
Market	Women	23.91	17.58	21.78	20.27	0.06
		(8.13)	(8.36)	(3.28)	(7.35)	(0.07)
	Men	46.94	43.50	38.26	42.40	-0.07
		(5.22)	(6.68)	(6.41)	(7.01)	(0.02)
Domestic	Women	28.11	32.86	27.02	29.92	-0.04
		(6.77)	(5.99)	(4.45)	(6.22)	(0.03)
	Men	5.22	8.81	13.77	9.78	0.37
		(2.28)	(3.92)	(3.35)	(4.66)	(0.05)
Care	Women	9.00	9.34	8.02	8.82	-0.03
		(1.88)	(3.44)	(1.65)	(2.69)	(0.04)
	Men	3.15	3.37	4.48	3.70	0.22
		(2.00)	(1.99)	(1.46)	(1.88)	(0.07)
Number of countries		10	23	17	50	

Note: This table reports the average weekly hours worked per married adult in market, domestic services, and care activities by country income group and across countries. Columns 1 to 3 report these numbers by country income group, namely low-income (LIC), middle-income (MIC), and high-income country (HIC). A LIC (HIC) countries has a GDP per capita below \$5,000 (above \$30,000). Column 5 reports the elasticity for each hours worked series with respect to GDP per capita (PPP). The numbers in parentheses are standard deviations for columns (1) to (4). In column 5, these numbers are standard errors.

4.2 Domestic services production and country income per capita

Our time use data allow us to go beyond market work and analyze time spent producing domestic services. Figure 1 presents this information. Two pieces of evidence stand out. First, we find that the time married men spend producing domestic services increases sharply with country income per capita. Also, we find that the time married women spend producing domestic services is (weakly) hump-shaped in country income per capita.

The differences in the time married men spend producing domestic services are strikingly large across country income groups. Men reported spending 5.2 hours per week on domestic services in low-income countries, 8.8 hours per week in middle-income countries, and 13.7 hours per week in high-income countries. This implies an elasticity of domestic hours with respect to country GDP per capita of 0.37. This strong increase mirrors the decline in market hours worked with GDP per capita.

Married women in all countries spend far more time producing domestic services than men, with an average across countries of 29.9 hours, compared to 9.8 hours for men. This implies that in most countries, women spend more time producing domestic services than working in the market.

However, there is substantial variation across country income groups. In low-income countries, hours of domestic services and market work by women are very similar, at 28.1 hours weekly for domestic services compared to 23.9 hours per week for market work. This difference is slightly larger in high-income countries, at 27.0 hours for domestic services compared to 21.8 hours for market work. The gap is much greater, however, in middle-income countries, where women spend 32.9 hours producing domestic services but only 17.6 hours working in the market.

Hours of domestic services by women thus exhibit a slight hump shape in GDP per capita, somewhat mirroring the U-shape in market hours worked – and displaying the same dispersion as market hours. Note that the relationship between domestic services and market work for women is not simply a mechanical artifact; because of other categories (e.g., leisure and care work), domestic services plus market work does not sum to a constant.

These differences also imply striking variation in how many hours married women spend

producing domestic services compared to men. Consider the ratio of hours of domestic services by women relative to hours of domestic services by men. This ratio averages 5.4 in low-income countries and 3.7 in middle-income countries. In rich countries, by contrast, it is slightly below two.

4.3 Care work and income per capita

Our data also reveal three novel patterns in care work. First, the average hours of care work by married men increase with the country's income per capita. Second, the average hours of care work by married women are flat in income per capita. Third, in households with children under the age of 5, care hours by both married women and men increase with country income per capita.

As with domestic services, men's hours of care work increase with GDP per capita, from 3.1 to 3.4 in low- and middle-income countries to 4.5 in high-income countries. While the increase is small in absolute terms, it is large in relative terms. The elasticity of care hours by men with respect to country GDP per capita is 0.22 and is statistically significant.

Perhaps surprisingly, care work by women is relatively constant across country income groups, with an average of around 9 hours a week. As is the case for domestic services, women perform the bulk of care work – roughly three times as many hours as men in low- and middle-income countries. In rich countries, this ratio is slightly below two.

It is natural to ask whether differences in fertility across country income groups affect this pattern, given that fertility rates (the average number of births per woman) are far higher in low-income countries than in higher-income countries (United Nations, World Population Prospects 2022). To establish the effect of this difference, we compute hours worked for married women and men who live in households with children under the age of 5. We perform this calculation for the 16 countries with time-use surveys for which information on household composition is available. Figure 6 shows that for this population, care hours are twice as high as for the general population. Moreover, care hours increase strongly in country GDP per capita for both men and women. Care hours by women with young children are 41% higher in high-income countries (21.8 hours) compared to low-income countries (15.4 hours). The flat pattern for the population as a whole thus reflects the greater share of households with young children in poor countries – but also captures what appears to be an increase in care hours per child. Overall, conditioning on children does not affect the qualitative patterns observed for other types of work.

4.4 Variation within country income groups

While Figure 1 reveals that hours worked differ across country income groups, the more striking pattern is the large variation in hours worked across countries with similar levels of income. This is particularly true for women's hours worked in middle-income countries. More formally, Table 2 shows the standard deviation across countries, for men and women, of hours worked for each type of work. The coefficient of variation of hours of market and domestic services is generally higher for women, as is visually apparent from Figure 1. The dispersion in hours is generally somewhat smaller among high-income countries and largest among middle-income countries.[19]

In the middle-income countries for which we have data, there is huge variation in the ratio of market hours worked by women relative to market hours worked by men. For China, Mongolia, Cambodia, Ghana, and Estonia, women work close to 30 hours per week in the market – quite close to the level worked by men. In contrast, men work at least four times more market hours than women in Morocco, India, Egypt, or Iraq – countries that are similar in per capita

[19]The R^2 of a linear regression of hours worked for married women on country GDP per capita are 0.007, 0.025, and 0.016 for market, domestic, and care work, respectively, suggesting that income per capita explains very little of the variation.

income.[20] In summary, our data suggest that the *variation* in the gender division of work *within country income groups* is large, particularly among middle-income countries.

The cross-country differences in the gender division of work call for explanation. One candidate explanation might be differences in the composition of the population across countries – for example, in the age structure of the population or the patterns of marriage. However, in section B.2, we measure composition-adjusted hours worked using population shares from the US in 2015. The relationship between all three types of work and country income level is somewhat weaker in composition-adjusted data, but all relationships documented above persist.

The variation among countries at similar levels of per capita GDP makes it clear that country income is only one of the factors driving the gender division of work. Efforts to explain the observed patterns need to incorporate factors other than aggregate productivity or country income. The dispersion across countries motivates our use, later in this paper, of a theoretical and empirical framework in which countries differ in terms of various wedges as well as income levels.

4.5 Country Experiences

We now document the evolution of hours worked over time for married men and women in Tanzania, India, Korea, France, and the United States. We focus on this illustrative set of countries since they span a wide range of income levels and geographic regions, and because their time-use surveys cover at least ten years.[21]

Table 3 reports the average weekly market hours for married men and women over time in five countries. Market hours worked by men have declined everywhere except for Tanzania, where they increased slightly. In the US, the country with the longest time series, men's market hours have dropped by 12.3 hours over the past half-century. In France, for the much shorter period between 1999 and 2009, men's market work declined by 1.6 hours. In India and Korea, as discussed above, the level of men's market hours is substantially higher, but these countries too saw a decline in men's hours.

For women's hours, country experiences are much more heterogeneous. Women's market work increased strongly in the US by 10.5 hours. Hours were nearly constant in France, dropping slightly in Korea and sharply in India and Tanzania. The decline of 9.3 hours in India over the past 20 years is particularly striking.

The table also reports hours of domestic services worked by married men and women. In the United States, domestic service hours by US men increased by 7.8 hours, in line with our finding in the cross-section of countries. The experiences of the other four countries are more mixed. For married women in the US, we document a decline in domestic service work by 11.0 hours, mirroring the increase in hours worked by men. In France, women's domestic service hours also declined significantly, by 5.3 hours. The decline in Korea parallels that in France, over a shorter period. Indian women maintained a very high level of hours devoted to domestic services. Here, the country that stands out is Tanzania, with an increase of 4.1 hours worked by women in domestic services.

The patterns of care hours are also reported in Table 3. Care hours worked by men increased in all countries except for Tanzania. Given their low initial level, the increase is large in proportional terms, with men's care hours increasing by 100% or more in several countries. The exception is Tanzania, where they declined from 2.1 to 1.5 hours. Unlike domestic service hours, women's care hours also increased over time in all countries.

[20] Note that four of the countries with high women's hours used to be under communist leadership, while three of those with low women's market hours have majority Muslim populations. We return in Section 6.3 to the relationship between patterns of work and country characteristics.

[21] The other countries for which we can construct similar time series (spanning at least ten years) are Austria, Canada, Great Britain, Italy, Japan, Netherlands, Palestine, Serbia and South Africa.

Table 3: Average Hours Worked by Married Men and Women over Time

		Market			Domestic			Care		
Country	Year	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio
Tanzania	2006	46.5	30.9	0.7	5.1	26.1	5.1	2.1	6.4	3.1
	2021	47.5	24.8	0.5	5.5	30.2	5.5	1.5	7.7	5.2
India	1998	52.6	21.3	0.4	5.3	40.3	7.6	1.5	6.3	4.1
	2019	51.2	12.0	0.2	3.5	40.9	11.5	2.2	6.5	2.9
Korea	1999	52.6	25.1	0.5	4.0	29.2	7.3	1.8	8.7	4.8
	2009	50.2	23.5	0.5	5.0	26.5	5.3	2.4	9.3	3.9
France	1999	36.7	19.4	0.5	14.9	31.7	2.1	2.0	5.8	2.9
	2009	35.1	19.9	0.6	14.4	26.4	1.8	2.7	6.0	2.2
United States	1965	51.4	15.0	0.3	7.7	34.5	4.5	2.9	8.7	3.0
	2021	39.1	25.5	0.7	15.5	23.5	1.5	5.5	9.5	1.7

Note: The table reports average weekly hours spent in market, domestic and care work for married men and women aged 15-64 as well as the women to men ratio.

5 A Model of the Household Division of Work

What determines the heterogeneous patterns in the gender division of work we document? Many potential candidates have been proposed in the literature, ranging from gender wage gaps and social norms to sexual harassment and unsafe work environments for women. Variations in policies (e.g., in the availability and affordability of daycare) and in the types of home production technology have also been invoked as explanations. To distinguish among theories, we build a model of couples who choose hours of the three types of work for both members.

These choices are interdependent in the sense that a member's hours choice for one type of work depends on choices for the other types of work, as well as on hours worked by the other household member. They also respond to country-specific wages, activity wedges, and gender wedges. In the spirit of Chari et al. (2007), different wedges affect different choice margins and, therefore, leave distinct traces in the data. We set up the problem in a way that delivers analytical solutions. This allows us to infer model parameters transparently, given observed wages and allocations.[22] This analysis reveals which groups of channels are most important in accounting for the data.

In this section, we present the model and show how to use it to back out these wedges in each country. We also discuss which real-world factors the different wedges capture.

5.1 Model setup

We model the decision problem of a representative couple consisting of a woman (superscript f) and a man (m). [23] The couple chooses hours of market work (subscript m), domestic services work (d), and care work (c) for both members. We use the generic subscript i for activities and superscript g for gender, denoting hours in activity i by gender g by L_i^g. We occasionally refer to domestic services and care jointly as "non-market services". The couple thus chooses the six allocations $L_m^f, L_m^m, L_d^f, L_d^m, L_c^f$ and L_c^m, taking wages w^g and productivity in home production and care z_d and z_c as given.

[22] We discuss some extensions at the end of this section and provide details in Appendix C.2.

[23] Our model matches our data in focusing on married opposite-sex couples. The model holds more generally for any cohabiting pairs of individuals who make joint labor decisions.

Preferences. The couple's objective function is

$$U = u^f + u^m, \tag{1}$$

where u^g denotes the utility of each member.[24] Individuals value a consumption aggregate c^g and dislike work, captured by a labor aggregate L^g.[25] Individual preferences over these aggregates are defined as

$$u^g = \frac{c^{g\,1-\sigma}}{1-\sigma} - \frac{L^{g\,1+\frac{1}{\phi}}}{1+\frac{1}{\phi}}, \quad \sigma, \phi > 0. \tag{2}$$

The consumption aggregate for an individual is a constant elasticity of substitution (CES) aggregate of the individual's consumption of market goods c_m^g, domestic services c_d^g and care c_c^g, with an elasticity of substitution ε, $\varepsilon > 0$. The labor aggregate is a CES aggregate of market work L_m^g, hours spent producing domestic services L_d^g and hours spent producing care services L_c^g, with elasticity of substitution ρ, $\rho < 0$.[26]

$$c^g = \left[c_m^{g\,\frac{\varepsilon-1}{\varepsilon}} + B_d c_d^{g\,\frac{\varepsilon-1}{\varepsilon}} + B_c c_c^{g\,\frac{\varepsilon-1}{\varepsilon}} \right]^{\frac{\varepsilon}{\varepsilon-1}}, \quad \varepsilon > 0 \tag{3}$$

$$L^g = \left[D_m^g L_m^{g\,\frac{\rho-1}{\rho}} + D_d^g L_d^{g\,\frac{\rho-1}{\rho}} + D_c^g L_c^{g\,\frac{\rho-1}{\rho}} \right]^{\frac{\rho}{\rho-1}}, \quad \rho < 0. \tag{4}$$

We assume that the elasticities $\sigma, \phi, \varepsilon$ and ρ are common across countries, whereas B_d, B_c, D_m^g, D_d^g and D_c^g vary across countries. The parameters B_d and B_c, which are common across members of the couple, capture how much the couple values domestic services and care relative to market goods. The parameters D_i^g differ by type of work and gender. These "gender wedges" reflect the disutility of different types of work for each individual. The parameter ϕ is the Frisch elasticity of labor supply in the special case $\rho = -\phi$. More generally, the Frisch elasticity in the model depends not only on ϕ, but also on ρ and allocations, as shown in Section 5.3.2.

The parameter ρ captures the elasticity of substitution across types of work: in response to an increase in the relative return of one activity by one percent, for fixed marginal utility, relative work effort in that activity optimally increases by $-\rho$ percent, a positive quantity since $\rho < 0$. We show this explicitly in equation (12) below. The parameter ρ also affects how choices of different types of work interact. In the special case $\rho = -\phi$, the disutility of work is additively separable in its three components. We show in Section 5.2.1 that for $\rho \neq -\phi$, the allocation of time to work of type i depends on choices regarding other types of work.

Overall, our setup extends that in BK21 from an individual to a couple, and also introduces non-separable disutility of work.

Technology. The couple pools resources. We assume that all goods are rival and abstract from saving for tractability. The budget constraint for market goods then is:

$$c_m^m + c_m^f = w^m L_m^m + w^f L_m^f. \tag{5}$$

Household outputs of domestic services and care are linear in the total labor inputs. These services cannot be traded or stored. The budget constraint for non-market service i then is:

$$c_i^m + c_i^f = z_i (L_i^m + L_i^f), \quad i = c, d. \tag{6}$$

[24] We assume equal utility weights for simplicity. See section 5.4 and footnote 34 for a discussion on how unequal weights would affect our findings. We also abstract from intrahousehold bargaining, in which the utility weights would be endogenously determined (as discussed, for example, in Doss (2013) or Doepke and Tertilt (2016)).

[25] These are MaCurdy (1981) preferences. They allow for optimal total work to vary with a country's productivity level (Boppart and Krusell, 2020). In our formulation below, they also allow for the disutility of work to differ by type of work, as in BK21. Implicitly, this formulation implies diminishing marginal utility of leisure.

[26] $\rho < 0$ implies that indifference curves are concave to the origin, as is appropriate for a "bad".

Implicit in these budget constraints is that the members of the couple have equal productivity z_i in domestic services and care as in BK21. We discuss the implications of this assumption in Section 5.4.

As is typical in models of home production, the parameters B_i and z_i cannot be identified separately without data on the consumption of domestic services and care work. We therefore define the joint parameters $\omega_i \equiv B_i z_i^{\frac{\varepsilon-1}{\varepsilon}}, i = c, d$, again following BK21. As noted above, ω_c and ω_d are our *"activity wedges"*, since they capture all factors that affect the relative valuation of different types of work (activities). In Section 5.4, we discuss in detail the factors captured by this wedge. There, we show that besides preferences and technology, activity wedges also reflect factors such as the use of home appliances or market substitutes for domestic or care services.

5.2 Optimal choices of work hours

The couple maximizes overall utility subject to prices and budget constraints. We now discuss the optimal choice of the six hours allocations $L_m^f, L_m^m, L_d^f, L_d^m, L_c^f$ and L_c^m in three steps: across genders for a given activity (this delivers three ratios), across activities for a given gender (two ratios), and finally the level.

5.2.1 Gender division of work for each type of work.

The optimal gender ratio of market hours worked in the couple is

$$\left(\frac{L_m^f}{L_m^m}\right)^{-\frac{1}{\rho}} = \frac{w^f}{w^m}\frac{D_m^m}{D_m^f}\left(\frac{L^f}{L^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}. \tag{7}$$

Defining

$$\Theta_m^f \equiv \frac{L^f}{L_m^f D_m^{f\,\frac{\rho}{\rho-1}}} = \left[1 + \frac{D_d^f}{D_m^f}\left(\frac{L_d^f}{L_m^f}\right)^{\frac{\rho-1}{\rho}} + \frac{D_c^f}{D_m^f}\left(\frac{L_c^f}{L_m^f}\right)^{\frac{\rho-1}{\rho}}\right]^{\frac{\rho}{\rho-1}} \tag{8}$$

we can rewrite this as

$$\left(\frac{L_m^f}{L_m^m}\right)^{\frac{1}{\phi}} = \frac{w^f}{w^m}\left(\frac{D_m^m}{D_m^f}\right)^{1+\frac{\rho}{\rho-1}\left(\frac{1}{\phi}+\frac{1}{\rho}\right)}\left(\frac{\Theta_m^f}{\Theta_m^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}, \quad \rho < 0. \tag{9}$$

The optimal gender division of work depends on three terms. First, each household member's relative market hours increase in the relative wage. As a result, higher wages for women imply greater optimal market hours for women, whereas higher wages for men have the opposite effect.

Second, the optimal gender division depends on the relative disutility of market work. We refer to the ratio D_m^f/D_m^m as the *gender wedge* of market work, and denote it by μ (for market). Equation (9) illustrates the units of the gender wedge μ. In the special case $\rho = -\phi$, the wedge is in the same units as the gender wage ratio w^f/w^m. Consequently, a 1% increase in the wedge has the same effect on L_m^f/L_m^m as a 1% decline in the wage ratio or a 1% greater tax on women's labor income. In our benchmark calibration, the exponent on μ is approximately 2.2, so that the effect of a change in the wedge μ is larger than the square of an identical change in the wage ratio or a gender-specific tax.

The third term captures an *interaction across work types*. In the special case $\rho = -\phi$, utility is additively separable in the three types of work, and this term drops out. As a result, the three gender ratios are independent so that the allocation of non-market work does not affect the allocation of market work. If $\rho \neq -\phi$, the optimal allocation of market work also depends on the allocation of non-market work via Θ_m^g. For $\rho < -\phi$, greater relative non-market work by

household member g reduces their optimal relative market work. For example, if women spend more hours doing domestic services, the optimal number of hours they spend in market work is lower.[27]

Similarly to market work, the optimal gender ratio of non-market work is

$$\left(\frac{L_i^f}{L_i^m}\right)^{\frac{1}{\phi}} = \left(\frac{D_i^m}{D_i^f}\right)^{1+\frac{\rho}{\rho-1}\left(\frac{1}{\phi}+\frac{1}{\rho}\right)} \left(\frac{\Theta_i^f}{\Theta_i^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}, \quad i = c, d, \tag{10}$$

where Θ_i^g is defined analogously to Θ_m^f. Given equal productivity in non-market work, relative hours depend only on two factors: the relative input of non-i work and the *gender wedge* of work type i, D_i^f/D_i^m. Let this wedge be δ for domestic services and κ for care work.

It follows from equation (7) and its equivalent for domestic services that

$$\left(\frac{L_m^f}{L_m^m} / \frac{L_d^f}{L_d^m}\right)^{-\frac{1}{\rho}} = \frac{w^f}{w^m}\frac{\delta}{\mu} \tag{11}$$

and analogous for care work. That is, differences in gender ratios across types of work only reflect differences in gender-biased terms across types of work, namely gender ratios of returns and gender wedges. Gender-neutral terms, like ω_i or the overall level of income, do not appear in this equation because they affect all gender ratios of work in the same way.

5.2.2 Allocation of time across types of work for each household member

The optimal ratio of women's market work to non-market work of type i is

$$\left(\frac{L_m^f}{L_i^f}\right)^{\frac{1}{\varepsilon}-\frac{1}{\rho}} = \frac{w^{f\,\frac{\varepsilon-1}{\varepsilon}}}{\omega_i}\frac{D_i^f}{D_m^f}\left(\frac{(w^m L_m^m)/(w^f L_m^f)+1}{L_i^m/L_i^f+1}\right)^{-\frac{1}{\varepsilon}}. \tag{12}$$

It is optimal to spend more time on market work if the wage is high relative to ω_i, if the marginal utility of market goods consumption relative to i is high (as indicated by the last term in the equation), or if the disutility of market work relative to i is low. This equation shows formally that $-\rho$ is the elasticity of substitution between different types of work effort, given relative marginal utility.

The expressions are analogous for men. This implies that if wages and disutilities were equal across genders, differences in the activity wedge ω_i across countries on their own – perhaps due to differences in the availability of market substitutes – would not lead to differences in the gender allocation of work across countries. Differences in ω_i only affect the gender allocation of work when combined with gender wage gaps or gender wedges.

5.2.3 The optimal level of hours worked.

The optimal level of hours is obtained by combining the first-order conditions for consumption and work with the budget constraints. The resulting optimal level of market hours for women is

$$L_m^{f\,\sigma+\frac{1}{\phi}} = 2^\sigma \frac{w^{f\,\frac{\varepsilon-1}{\varepsilon}}}{D_m^{f\,1+\frac{\rho}{\rho-1}\left(\frac{1}{\phi}+\frac{1}{\rho}\right)}} \Omega_m^{f\,\frac{1-\sigma\varepsilon}{\varepsilon}} \Theta_m^{f\,-\frac{1}{\phi}-\frac{1}{\rho}} \left(1+\frac{w^m L_m^m}{w^f L_m^f}\right)^{-\frac{1}{\varepsilon}}, \tag{13}$$

[27] Why does the interaction across types of work flip sign at $\rho = -\phi$? Greater non-market work has two effects on the optimal allocation of market work. First, it raises the overall disutility of labor. This pushes towards lower market work. Second, it reduces the disutility of market work relative to non-market work. This pushes towards more market work. The first effect dominates if relative disutility does not change too much with relative work, which is the case when the absolute value of ρ is large, as in our calibration. The two effects cancel when $\rho = -\phi$.

where

$$\Omega_m^f \equiv \left[{w^f}^{\frac{\varepsilon-1}{\varepsilon}} \left(1 + \frac{w^m}{w^f}\frac{L_m^m}{L_m^f}\right)^{\frac{\varepsilon-1}{\varepsilon}} + \omega_c \left(\frac{L_c^f}{L_m^f}\right)^{\frac{\varepsilon-1}{\varepsilon}} \left(1 + \frac{L_c^m}{L_c^f}\right)^{\frac{\varepsilon-1}{\varepsilon}} + \omega_d \left(\frac{L_d^f}{L_m^f}\right)^{\frac{\varepsilon-1}{\varepsilon}} \left(1 + \frac{L_d^m}{L_d^f}\right)^{\frac{\varepsilon-1}{\varepsilon}} \right]^{\frac{\varepsilon}{\varepsilon-1}}.$$

The optimal level of women's market work depends on both spouses' wages, women's disutility of market work, as well as all other disutilities of work (via the gender ratio of market work, Θ_m^f and Ω_m^f), the overall marginal utility of consumption (via Ω_m^f and the final term) and work effort exerted in other types of work (via Θ_m^f). The term Ω_i^g is defined as c/L_i^g, and maps type i work by gender g into overall household consumption at optimal choices. The initial right-hand-side term 2^σ reflects the fact that, given equal weights of both spouses in household utility, consumption is shared equally.[28]

Equation (13) also reveals the income effect in this model. A proportional increase in w^f, w^m and in home productivity does not change any labor ratios, but raises the term Ω_m^g proportionally. Hence, the elasticity of market work with respect to the productivity of all activities jointly is $(1-\sigma)/(\sigma + \frac{1}{\phi})$, which is negative if $\sigma > 1$. This is akin to Boppart and Krusell (2020), who study the decline in men's market hours in rich countries.

5.2.4 The Frisch elasticity

The compensated elasticity of market work with respect to the own wage is[29]

$$\left[-\frac{1}{\rho} + \left(\frac{1}{\phi} + \frac{1}{\rho}\right) {\Theta_m^g}^{\frac{1-\rho}{\rho}} \right]^{-1}. \tag{14}$$

for gender g. In the special case $\rho = -\phi$, this simplifies to ϕ. When $\rho < -\phi$, the Frisch elasticity is larger than ϕ, and more so the greater the absolute value of ρ and the greater non-market work (which raises Θ_m^g). Intuitively, when $\rho < -\phi$, greater non-market work raises the marginal disutility of market work. As a result, the fact that women perform more non-market work than men implies a greater Frisch elasticity of market work for women, as typically found empirically (see e.g. Blundell et al., 2016), despite identical elasticities ϕ and ρ in individual preferences. We use this result to calibrate the elasticities ϕ and ρ.

5.3 Identification

We now combine the model with the cross-country data to infer model parameters. The intuition for the identification of parameters has three components. First, the optimal gender division of a given type of work in the model depends on relative wages, hours of other types of work, and the gender wedge. Since the first two are observed, we can infer the gender wedge. Second, since the optimal allocation of time across types of work for a given gender depends on observables, ω_i and relative disutility across types of work, it allows us to infer one of the latter. Finally, the observed level of market work reveals the level of disutility of market work.

There are eight parameters, two activity wedges (ω_c, ω_d), and six disutilities $(D_m^f, D_m^m, D_d^f, D_d^m, D_c^f, D_c^m)$, but only six model equations. We thus assume:

$$D_m^m = D_d^m = D_c^m.$$

This assumption fixes two parameters. Its effect is to scale ω_i. It also allows us to infer Θ_i^g from observed hours choices. We discuss its implications for our results below.

[28] It is straightforward to extend the model to more members, or more activities. For more members, the equations in Section 5.2.1 apply for any pair of household members. For more activities, the equations in Section 5.2.2 apply for any activity i relative to market work. For the optimal level of hours given in equation (13), the terms Θ, Ω and the term in 2 need to be adjusted appropriately.

[29] See Appendix C.1 for details on the derivations in this section.

5.3.1 Identification of wedges

Gender wedges. Equation (7) implies that the gender wedge for market work is

$$\mu \equiv \frac{D_m^f}{D_m^m} = \frac{w^f}{w^m}\left(\frac{L_m^f}{L_m^m}\right)^{\frac{1}{\rho}}\left(\frac{L^f}{L^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}} \tag{15}$$

and that for non-market work is

$$\delta \equiv \frac{D_d^f}{D_d^m} = \left(\frac{L_d^f}{L_d^m}\right)^{\frac{1}{\rho}}\left(\frac{L^f}{L^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}, \quad \text{and} \quad \kappa \equiv \frac{D_c^f}{D_c^m} = \left(\frac{L_c^f}{L_c^m}\right)^{\frac{1}{\rho}}\left(\frac{L^f}{L^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}. \tag{16}$$

We cannot directly compute these from observables because L^f/L^m is not observed. However, a few manipulations of equations (15) to (16) bring us to our goal. Taking ratios of these equations yields

$$\mu/\delta = \frac{w^f}{w^m}\left(\frac{L_m^f}{L_m^m}/\frac{L_d^f}{L_d^m}\right)^{\frac{1}{\rho}}, \quad \text{and} \quad \mu/\kappa = \frac{w^f}{w^m}\left(\frac{L_m^f}{L_m^m}/\frac{L_c^f}{L_c^m}\right)^{\frac{1}{\rho}}. \tag{17}$$

These ratios of wedges can be measured directly from the data.

Next, rewrite equation (15), using the definition of Θ^g in equation (8). This yields

$$\mu^{1+\frac{\rho}{\rho-1}\left(\frac{1}{\phi}+\frac{1}{\rho}\right)} = \left(\frac{D_m^f}{D_m^m}\right)^{1+\frac{\rho}{\rho-1}\left(\frac{1}{\phi}+\frac{1}{\rho}\right)} = \frac{w^f}{w^m}\left(\frac{L_m^f}{L_m^m}\right)^{-\frac{1}{\phi}}\left(\frac{\Theta_m^f}{\Theta_m^m}\right)^{-\frac{1}{\phi}-\frac{1}{\rho}}. \tag{18}$$

Under Assumption 1, Θ_m^m is known, as it only involves observed labor allocations. Θ_m^f is also known, since Assumption 1 implies

$$D_d^f/D_m^f = D_d^f/D_d^m \cdot D_d^m/D_m^m \cdot D_m^m/D_m^f = \delta/\mu \tag{19}$$

$$D_c^f/D_m^f = D_c^f/D_c^m \cdot D_c^m/D_m^m \cdot D_m^m/D_m^f = \kappa/\mu, \tag{20}$$

which we have just obtained.

Equation (18) shows that low market hours by women, given relative wages and other work (via Θ_m^f/Θ_m^m), indicates a high gender wedge for market work (high μ). All else equal, the wedge is large when women work substantially fewer market hours than men. However, women's wedge for market work is also influenced by the wage gap and by their allocation of non-market hours. Heavy burdens of non-market work reduce their optimal market work (if ρ ¡ $-\phi$), lowering the inferred gender wedge. [30]

Activity wedges. Under Assumption 1, the analog of equation (12) for domestic service production or care by men directly implies an expression for ω_i as a function of observables:

$$\omega_i = w^{m\,\frac{\varepsilon-1}{\varepsilon}}\left(\frac{L_i^m}{L_m^m}\right)^{\frac{1}{\varepsilon}-\frac{1}{\rho}}\left(\frac{(w^f L_m^f)/(w^m L_m^m)+1}{L_i^f/L_i^m+1}\right)^{-\frac{1}{\varepsilon}}, \quad i = c, d. \tag{21}$$

We infer a high value of ω_i if non-market work is large relative to market work for a given wage. This can be due to preferences (B_i), productivity (z_i) or other factors which we discuss

[30] Intuitively, suppose that both women and men are working many hours. If women are disproportionately working in non-market activities (for example because men have higher disutility of non-market work), they have a high marginal disutility of market work. This reduces their optimal market work, and thus the inferred gender wedge in market work.

in Section 5.4. ω_i also absorbs differences in relative disutility across activities since Assumption 1 eliminates an additional term D_i^m/D_m^m on the right-hand side. In practice, it seems unlikely that our inferred ω_i mostly captures differences in disutility. Given the evolving nature of work, it seems plausible that the relative disutility of market work declines with economic growth. This would generate the opposite of the observed patterns in non-market relative to market work. Assumption 1 thus is conservative. If anything, our results might understate differences in ω_i with development.[31]

The disutility of market work. The level of the disutility of market work follows from the expression for the optimal level of market hours for women (equation (13)) as

$$ {D_m^f}^{1+\frac{\rho}{\rho-1}(\frac{1}{\phi}+\frac{1}{\rho})} = \frac{{w^f}^{\frac{\varepsilon-1}{\varepsilon}}}{{L_m^f}^{\sigma+\frac{1}{\phi}}} 2^\sigma {\Omega_m^f}^{\frac{1-\sigma\varepsilon}{\varepsilon}} {\Theta_m^f}^{-\frac{1}{\phi}-\frac{1}{\rho}} \left(1+\frac{w^m L_m^m}{w^f L_m^f}\right)^{-\frac{1}{\varepsilon}}, \tag{22} $$

where Ω_m^f is as above and can be computed using ω_i and data. We use equation (22) to measure the disutility of market work for women.

5.3.2 Elasticities

We calibrate the elasticities $\varepsilon, \sigma, \phi$ and ρ using strategies typical in the literature but adapted to our setting. First, we set ε to 2, following the survey by Aguiar and Hurst (2016). Next, following Boppart and Krusell (2020), we set σ to match the decline in market hours by married men in the United States, assuming that their disutility of market work has not changed. This implies a value of σ of 1.4. Finally, using equation (14), we set ϕ and ρ to match Blundell et al.'s (2016) estimates of the Frisch elasticity for men and women in the United States of 0.68 and 0.96. Given US data, this requires ϕ of 0.53 and ρ of -3.14.

5.3.3 Discussion

Our strategy for measuring wedges relies on the fact that activity wedges affect how much time the couple as a whole spends on that type of work, whereas the gender wedge enters the allocation of this work by gender. This allows us to distinguish gender wedges from activity wedges.

This identification strategy relies on the fact that we have data on both market and non-market work for both men and women. Suppose that we observed only that, in a given country, women's market work is low and non-market work high. Without knowing comparable data on men, we would not be able to infer whether this is due to gender wedges (high μ/δ and/or high μ/κ) or activity wedges (high ω_i). Observing men's market and non-market work lets us distinguish these scenarios. If men also do a lot of non-market work relative to market work, this indicates high ω. If, in contrast, men do little non-market work, this indicates a role for gender wedges.

5.4 Parameter interpretation and model extensions

Before connecting the model to data, we briefly discuss the interpretation of parameters and how extensions to our simple model would affect labor allocations in the household.

[31] If the disutility ratio D_i^m/D_m^m is common across countries or over time, the assumption simply scales ω_i for all countries, and ratios of ω_i across countries or time are independent of the unobserved common ratio D_i^m/D_m^m.

Gender wedges. Measured gender wedges capture any factor affecting the allocation of work by gender, other than wages and the interaction of work types. Three such factors seem particularly salient for our context. The first are social norms, which are rules that are "neither promulgated by an official source, such as a court or a legislature, nor enforced by the threat of legal sanctions, yet [are] regularly complied with" (Posner, 1997, p. 365). In our context, these norms may involve expectations about the type of work that is appropriate for men and women, as well as the conditions under which they may work. Patriarchal social norms may restrict the set of people whom women may interact with in public places; if so, this may affect their choice of work.[32] Social norms may also suggest that it is inappropriate for men to do domestic services.

The second factor is the nature of the work – and of the work environment. Given the sectoral and occupational structure within a country, a specific activity may have different disutility for women and men. For instance, women are much more likely to experience sexual harassment in the workplace, as well as in public spaces as they travel to work. This is true across the income distribution (Basu, 2003; Singh, 2016). Women may have greater disutility from exposure to chemicals in the workplace, especially during pregnancy. For safety reasons, women may prefer not to have to return from work late at night. All of these matters may make certain jobs or activities less appealing to women than to men.

The third factor is non-wage considerations affecting the economic return to work, such as gender-specific taxes, (dis)incentives (e.g., to contribute to retirement savings regimes), or costs for travel to work or appropriate clothing. For example, Bick and Fuchs-Schündeln (2017) document how progressive taxes combined with joint taxation of couples can imply marginal tax rates on secondary earners that exceed those of the primary earner. In the case of Germany, this can reach up to 20 percentage points. Borella et al. (2023) show large negative effects of joint taxation on the labor supply of US women.[33]

In section 6.3, we show that measured gender wedges are indeed strongly correlated with direct measures of gender-specific laws and norms, with weaker correlations to measures such as access to work.[34]

Activity wedges. How should we interpret differences in activity wedges ω across countries or over time? Major differences in the actual labor productivity of domestic services or care production seem implausible. But there could be differences in B_i, the preference component of ω_i, reflecting, for example, differences in the prevalence of young children.

Differences in the price or availability of home production substitutes or the price of appliances would also show up in the activity wedge ω_i.[35] First, consider an extension of our model where households can purchase home production substitutes – such as prepared food or cleaning services – in the market at a price p_s. If these enter the consumption aggregator analogously to home-produced services, higher prices of substitutes lead couples to spend more time producing

[32] Jayachandran (2021) identifies five specific categories of social norms that may pose barriers to women's labor force participation: (1) harassment and violence in public spaces; (2) restrictions on women's social interactions; (3) (lack of) control over household finances; (4) intimate partner violence linked to expectations that men should be sole or dominant breadwinners within households; and (5) socially embedded understandings of responsibilities for domestic and care work.

[33] Kaygusuz (2010) and Guner et al. (2012) also analyze the link between gender-specific taxes and market work by women in the US.

[34] Two other theoretical channels would have effects similar to gender wedges. First, unequal utility weights call for higher work hours by the partner with the lower weight. If women have low bargaining weights in countries where they perform few hours of market work, our measurement – which already finds large variation in gender wedges for market work – understates the true variation in μ. Second, if women had higher productivity in non-market work, this would also generate lower market and higher non-market work by women. This would imply that our measured gender wedges in non-market work δ and κ are understated. However, it turns out that the variation in δ and κ we find below (see Figures 2b and 2c) is very large, eclipsing plausible gender productivity differences.

[35] See Appendix C.2 for details on the two model extensions we present next.

home services themselves. High levels of ω_d, like the ones we find in high-income countries, could thus reflect high p_s in these countries.

Second, suppose that households can use appliances to produce domestic services, with the CES technology with elasticity $\eta > \varepsilon$ used by Greenwood et al. (2005). Then, cheaper appliances prompt households to use more capital and less time when producing domestic services. Cheaper appliances thus are not a plausible explanation for the higher domestic service hours we observe in high-income countries.

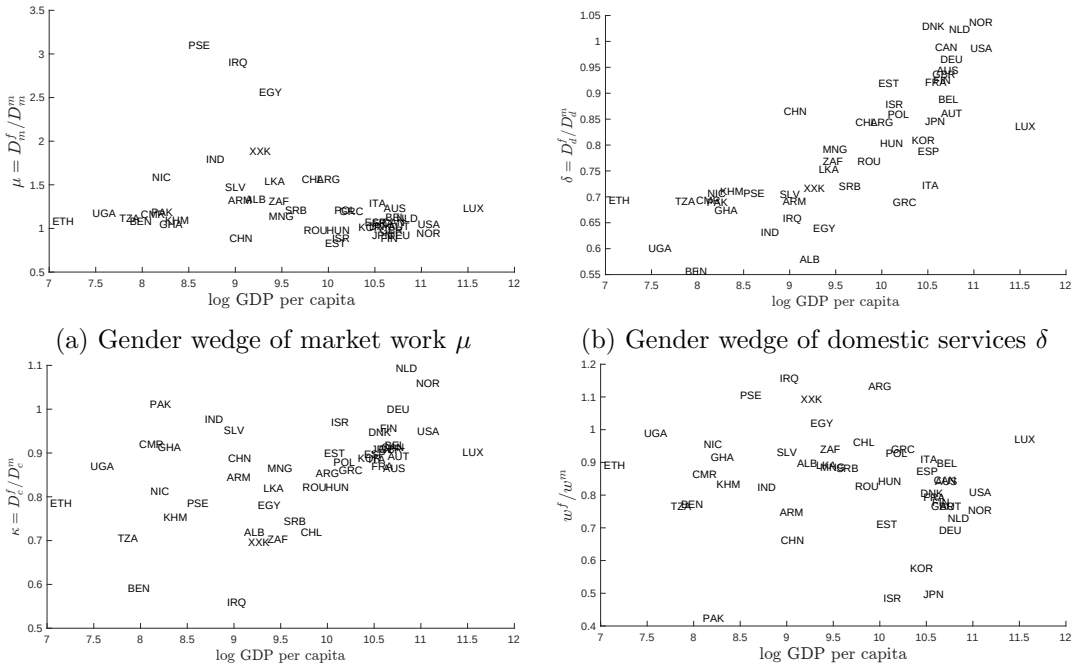
Finally, note that since these model extensions are gender-neutral, they affect measured activity wedges, but not gender wedges.[36]

6 Results

In this section, we first discuss the parameters implied by the data and model. We then illustrate the effect of measured wedges on the gender division of work, and we compare the measured wedges to evidence on cross-country variation in gender-relevant norms and laws. We then use the model to quantify the contributions of different wedges to the patterns of work observed in the data.

6.1 Inferred parameters

Figure 2 shows the values of inferred parameters for all countries, plotted against GDP per capita. The first three plots show gender wedges, while the bottom right plot shows the observed gender wage gaps that we feed into the model.[37,38]



(a) Gender wedge of market work μ

(b) Gender wedge of domestic services δ

(c) Gender wedge of care work κ

(d) Gender wage ratio w^f/w^m

Figure 2: **Inferred parameter values.**

[36] Labor income taxes also affect the time allocation between market and non-market work. However, the difference in ω between rich and poor countries we find below far exceeds that implied by tax difference between these countries.

[37] We do not address the sources of wage gaps. These are themselves potentially the product of discrimination or other socially embedded structures of economic and political power. For our purposes, we take them as given.

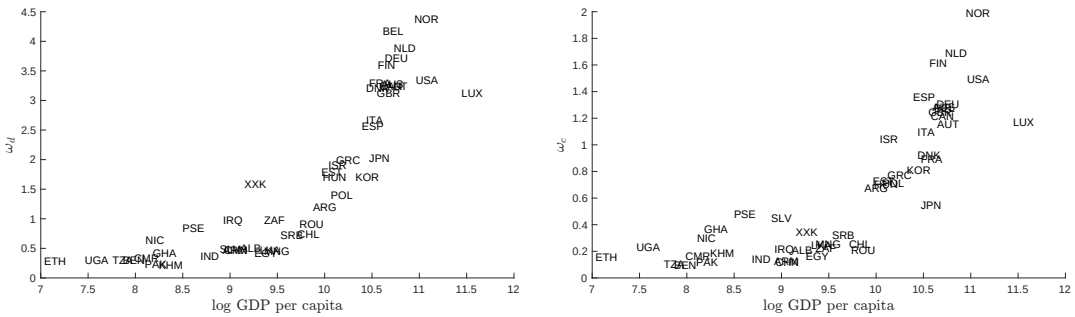
[38] Measured activity wedges are shown in Figure 3 in Appendix D.4.

Panel (a) shows the gender wedge of market work, μ. It exceeds one in most (¿ 80%) of the observations and in almost all of the low- and middle-income countries, implying that market work leads to greater disutility for women than for men. Across the countries in our sample, the average value of μ is 1.28. This wedge suppresses women's (relative) market hours to the same extent as taxing women's earnings at a rate that is 70% higher than the rate on men's earnings.[39] The median μ is 1.13, which still has the effect of an almost 31% larger tax.

Beyond these aggregate statistics, there are large differences across countries and country groups. The analysis shows that μ is generally close to 1 in the richest and the poorest countries, with averages in these groups of 1.06 and 1.17, respectively, indicating that, on average, relative market hours in these countries are well explained by wage gaps. In contrast, the average μ across middle-income countries is 1.51, with enormous variation within this group. It is greater than 2 in three countries, and greater than 1.5 in nine countries. Translated into tax equivalents, these values of μ correspond to a tax rate for women that is more than double the rate for men. The countries with these high values of μ are exactly the middle-income countries with the lowest relative market work by women.

The variation in the gender wedges of non-market work, shown in panels (b) and (c), is similarly large. These wedges are generally close to unity in rich countries. Although men perform significantly less non-market work than women in these countries, the model mostly attributes this to their higher levels of market work and not to gender wedges, with δ and κ close to 1. In middle-income and poor countries, in contrast, δ and κ are far below 1. Among low- and middle-income countries, however, these wedges vary substantially. For example, China has levels of δ and κ between 0.86 and 0.9 respectively. These values are close to those that we measure for France and other European countries. In contrast, for India the inferred δ is 0.63.

The graphs also show that gender wedges for domestic services and care work, while highly correlated, are not identical. For instance, India and Pakistan have very low values for δ, while κ in each country is close to 1.



(a) Activity wedge of domestic services ω_d (b) Activity wedge of care work ω_c

Figure 3: **Inferred parameter values – ω_d and ω_c.**

Figure 3 shows that activity wedges ω_i are clearly higher in richer countries. The activity wedges vary substantially with country income level, with an elasticity of ω_d (ω_c) with respect to GDP per capita of 0.81 (0.73). This tight correlation reflects a clear pattern in the data that high-income countries have both higher non-market hours and high wages. As discussed above, a potential reason is that these countries face relatively high prices for market services that might otherwise substitute for home services and care.

Both activity wedges are also low in middle-income countries, suggesting that the gender-neutral factors captured by the activity wedges do not explain the long hours women spend producing domestic services in these countries.

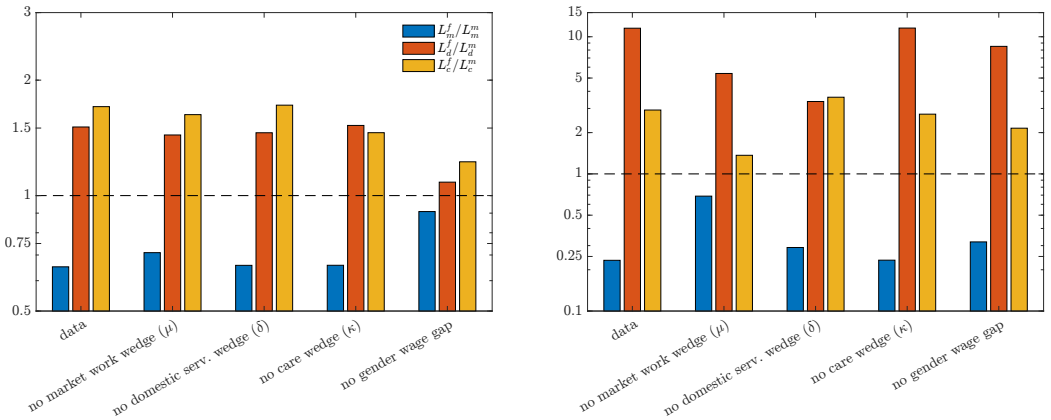
To sum up, it is clear from the analysis that gender wage gaps alone cannot explain a large share of the variation in the gender division of work across countries. We quantify this finding

[39] The tax rate differential is given by $1.28^{2.2}$.

further in Section 6.4.

6.2 The effect of wedges: an illustration

We now illustrate the mechanisms that are at work in the model. To do so, we take our calibrated model and eliminate the gender wage gap and gender wedges one by one (i.e., by setting each of them to one). We conduct this exercise for the US (Figure 4a) and for India (Figure 4b). In both figures, we compare the measured gender division of work with counterfactual values associated with eliminating the gender wage gap and each of the three gender wedges.



(a) USA (b) India

Figure 4: **The effect of gender wedges and wages on the gender division of work.** We set each gap or wedge, one by one, from its calibrated value to one and report gender ratios of hours for each type of work. Vertical axis on a log scale.

The figure clearly illustrates the direct effect of the gender wage gap and each of the three wedges on the associated type of work, as well as the interaction effect on the other work types. In the US, eliminating gender wedges has little effect on the gender division of work. This reflects the fact that the measured gender wedges in the US are already very close to 1. Closing the gender wage gap has a greater impact on women's relative market work, L_m^f/L_m^m. Our model predicts that equalizing wages for women would increase this ratio of market hours from 0.65 to 0.90. Through its effect on the other two work types, the elimination of the wage gap would also tend to equalize ratios of women's hours to men's hours in domestic services (from 1.51 to 1.08), and care work (from 1.71 to 1.22). In short, disparities in the gender division of market work largely reflect the gender wage gap.

Results are very different for India, one of the countries with the largest gender wedges. Changing the gender wedge for market work from its current level (1.8) to one almost triples women's relative market hours, L_m^f/L_m^m, from 0.24 to 0.69, with an absolute increase of nearly 20 hours per week in women's market work. As women's total workload increases, their marginal disutility from domestic services and care work rises strongly, leading to a substantial decline in the *share* of non-market work done by women, and to a decline of more than 10 hours in the absolute level of women's non-market work. [40]

Eliminating India's measured gender wedge for domestic services (i.e., increasing δ from the current level of about 0.63 to one) would reduce the gender imbalance in this activity, with the ratio L_d^f/L_d^m falling from 11.5 to 3.4. Eliminating this wedge also changes the gender ratios of

[40] Of course, setting the wedge to one is a very large change. As a benchmark, the results in the next section suggest that changing India's legal environment with regard to gender equality to mirror that of Albania or Armenia would increase women's market hours by 60% or 7 hours, far less than the amount implied by our counterfactual.

market work (from 0.23 to 0.29) and care work (from 2.92 to 3.62). Finally, eliminating the wedge for care work in India would have little effect. This wedge is already close to unity, at 0.98, and care work accounts for relatively few hours.

Finally, the model suggests that closing the gender wage gap in India would raise market work by women relative to men by 36% (from 0.23 to 0.32), with an absolute increase in women's market work of 3.7 hours. The overall impact on women's time use would be offset by a similar-sized decline in women's domestic services hours. While substantial, these effects are small compared to those obtained through eliminating the gender wedge of market work.

Overall, our analysis clearly conveys the large role of gender wedges in determining the gender division of work in some settings, as well as the interactions across wedges. In countries like the US, in contrast, where wedges are small, wage gaps matter more – affecting both market and non-market work.

6.3 What do wedges capture?

Our model-based measures of gender wedges and activity wedges are in units comparable to the gender wage gap, making them easy to interpret and amenable to counterfactual analysis. To elicit what our inferred wedges capture, we explore how they relate to various measures of women's well-being and social status. For this, we draw on several different sources. The Women, Business, and the Law Index (WBL), compiled by the World Bank, reports on a number of measures of women's legal and economic opportunity (World Bank, 2024). We combine the WBL measures with gender-related statistics on social attitudes from the World Values Survey (WVS) (Inglehart et al., 2020) and measures of religious affiliation from the World Religion Project (Maoz and Henderson, 2013).

Table 4: Correlation of Gender Wedges with Laws and Values

Wedges and WBL Index				Wedges and Values			
	Market (μ)	Domestic (δ)	Care (κ)		Market (μ)	Domestic (δ)	Care (κ)
WBL Index	-0.71	0.52	0.35	Main Index	-0.66	0.67	0.39
Mobility	-0.73	0.47	0.44	Job	-0.64	0.68	0.34
Workplace	-0.49	0.27	0.13	Politics	-0.66	0.65	0.44
Pay	-0.45	0.34	0.15	Education	-0.51	0.51	0.32
Marriage	-0.69	0.34	0.28	Secular values	-0.28	0.61	0.15
Parenthood	-0.58	0.49	0.27	Abortion	-0.46	0.75	0.41
Assets	-0.65	0.50	0.31	Divorce	-0.42	0.73	0.35
Pension	-0.17	0.23	0.33				

Note: The left panel reports the correlation of the estimated gender wedges in market (μ), domestic (δ), and care (κ) work with indices from the World Bank's Women's Business and the Law Index (World Bank, 2024). These indices have a higher score if a country has more gender-equal laws. The right panel reports their correlations with data and indices from the World Value Surveys (Inglehart et al., 2020). See Appendix Table 9 for detail on the questions.

Panel (a) of Table 4 shows correlations between the components of the World Bank's WBL index and the inferred wedges from our exercise. WBL scores are higher if a country has more gender-equal laws. The correlations of these measures with μ are all negative, illustrating that countries with more gender-equal laws have lower gender wedges of market work (lower μ). The correlations are lowest for pensions and entrepreneurship and highest for the indicators related to marriage, mobility, and assets.[41] This suggests that while the gender wedge μ captures

[41] Pensions and entrepreneurship are also the only two measures that are not statistically significant at conventional levels.

economic factors, like access to jobs, non-economic factors that discourage market work may also play an important role. Results are similar for the gender wedge of domestic services δ, and similar but weaker for that for care, κ.[42]

Panel (b) shows correlations between gender wedges and measures of values relating to gender equality from the WVS. Higher WVS values correspond to more gender-equal values. Countries with more equal gender values have lower gender wedges for market work, μ. The relationship between values and the gender wedge for domestic services δ is particularly strong.[43] These correlations are consistent with other empirical evidence from specific countries. For instance, Campaña et al. (2018) find for a set of Latin American countries that households with more egalitarian gender norms distribute work more equally. Similarly, Fortin (2005) finds that OECD countries with more widespread anti-egalitarian views have larger gender wage gaps and lower women's labor force participation rates.

Finally, Table 11 relates the inferred gender wedges to shares of the population of a country adhering to six major world religions as measured by the World Religion Project. Countries with a greater population share adhering to Islam have larger gender wedges for any type of work. The opposite is true, though less strong, for the Christian and secular population shares. For the remaining religions, correlations are insignificant.

Our model-based measures of gender norms are thus strongly related to survey-based measures. The correlations suggest that our measured wedges capture both economic and non-economic factors, even if we cannot literally map specific wedges to specific laws or policies. Next, we quantify their contributions to the gender division of work across countries.

6.4 Accounting for cross-country differences

The gender division of work depends on the gender wage gap, the allocation of other types of work, and gender wedges. How important is each of these factors in explaining cross-country differences?

To answer this question, we compute counterfactual allocations of work. In each counterfactual, we eliminate cross-country variation in one of the model parameters by setting it to its cross-country average while leaving the other parameters at their country-specific values. We then solve the model to obtain counterfactual allocations for each country.

The country-by-country results of this exercise are reported in Figure 5. In addition, Table 5 shows summary measures for these counterfactual economies. Panel (a) shows the gender ratio of hours in market work for the three-country income groups.[44] Panel (b) shows the variance of the log gender ratio of hours for each work type in the cross-section of countries. This provides a measure of how much of the cross-country dispersion in the data each factor accounts for.

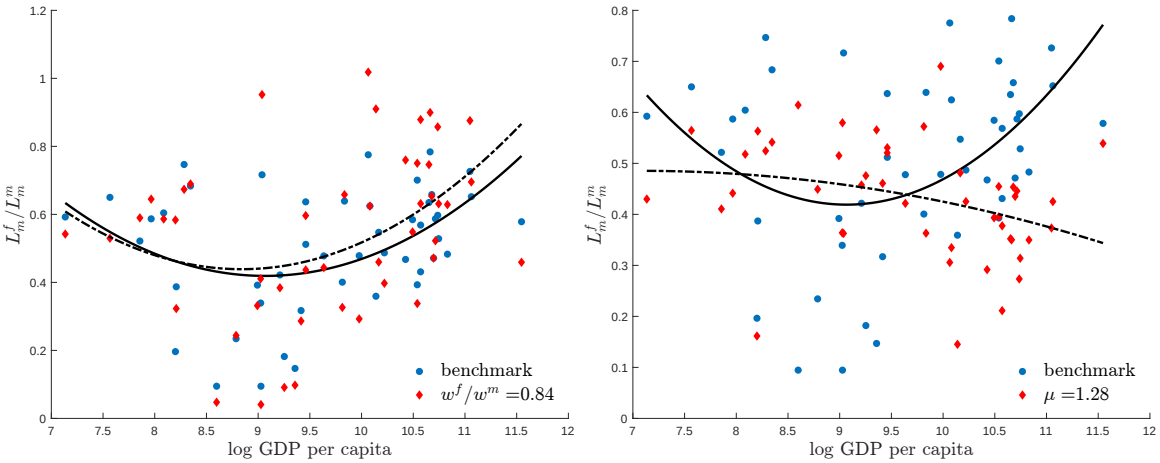
How much does variation in the gender wage gap contribute to observed hours choices? Panel (a) of Figure 5 shows the effect of replacing each country's gender wage gap, shown in Figure 2d, with the mean ratio w^f/w^m of 0.84. The graph shows the gender allocation of market work in the data (circles) and in the counterfactual economies (diamonds). This reveals that the dispersion in L_m^f/L_m^m across countries is *larger* when variation in the gender wage gap is removed. That is, differences across countries in the gender wage gap actually reduce variation in the gender allocation of market work. Concretely, they reduce the variance of $\ln(L_m^f/L_m^m)$ from 0.5 (common w^f/w^m) to 0.25 (data). This occurs because the countries with the lowest (highest) L_m^f/L_m^m actually have low (high) gender wage gaps. As a result, L_m^f/L_m^m in these countries would be even lower (higher) if they had the mean sample gender wage gap.

Gender wedges instead play a very large role in explaining variation in market work, as shown in panel (b). Setting μ to its mean value of 1.28 implies much lower relative market work

[42] Among the correlations with δ and κ, all correlations larger than 0.25 are statistically significant.

[43] All correlation coefficients are statistically significantly different from zero, with the exception of those for secular values with μ and with κ.

[44] See Appendix Table 13 for domestic services and care work.



(a) Market hours: common gender wage gap (b) Market hours: common market wedge μ

Figure 5: **Counterfactuals of market hours with respect to the gender wage gap and gender wedges.** Each figure shows the gender ratio of market hours against GDP per capita, in the data (blue) and the counterfactual economy (red). The full (dashed) line is a quadratic line of best fit for the benchmark (counterfactual). The counterfactual in Figure 5a (Figure 5b) consists in setting the gender wage gap (gender wedge of market work) in all countries to 0.84 (1.28).

by women in both rich and poor countries since these have lower levels of μ (see Figure 2a). Common μ also eliminates a large fraction of the variation in the gender allocation of market work in middle-income countries. As a result, variation in μ accounts for 60% of the variance in $\ln(L_m^f/L_m^m)$ across countries in the data.

Gender wedges regarding domestic services are similarly important. Appendix Figure 7a shows that setting δ to its cross-country average of 0.79 raises relative domestic services by men in poor countries by an order of magnitude while reducing it somewhat in rich countries. Variation in δ across countries accounts for 68% of the variance of $\ln(L_d^f/L_d^m)$ across countries in the data. Results are similar for κ and care work (see Figure 7c).

Appendix Figure 7b illustrates an interaction. It shows the effect of cross-country differences in gender wedges regarding domestic services on the gender allocation of *market* work. This reveals that wedges closer to 1 in poor countries imply not only lower relative domestic services by women in these countries, but also greater relative market work. Variation in the gender wedge for domestic work δ accounts for 16% of the log variance in the gender ratio of market hours L_m^f/L_m^m.

To summarize, we find that the variation in the gender division of work across countries is mostly driven by gender wedges – especially the gender wedge associated with market work. The variation in these wedges across countries explains about three-fifths of the variation in the gender division of all types of work. To give these findings a more intuitive interpretation, we argue that differences across countries in the gendered patterns of work are most closely linked to differences between men and women in the disutility of market work. For women, market work may bring an array of physical and emotional hazards, and women in the workplace may also be subjected to social judgments and sanctions of various kinds. We find that these issues matter quantitatively more than wage differentials in explaining variation in the gender division of work across countries.

6.5 Accounting for changes over time

What accounts for the changes in hours worked over time that we documented for Tanzania, India, Korea, France, and the United States? To answer this question, we use the model to

	Panel (a): Mean L_m^f/L_m^m by income group			*Panel (b):* Variance of log of ...		
	LIC	MIC	HIC	L_m^f/L_m^m	L_d^f/L_d^m	L_c^f/L_c^m
data	0.55	0.42	0.58	0.25	0.41	0.26
Counterfactual economies:						
common w^f/w^m	0.57	0.43	0.67	0.50	0.44	0.31
common μ	0.46	0.46	0.38	0.10	0.31	0.19
common δ	0.58	0.43	0.52	0.21	0.13	0.32
common κ	0.55	0.42	0.57	0.25	0.41	0.11

Table 5: Accounting for the cross-country dispersion of work.

The table shows data statistics and model outcomes from counterfactual model simulations. Panel (a) shows mean gender ratios of hours spent in market work, by country income group. See Appendix Table 13 for domestic services and care work. Low (high) income countries are those with GDP per capita below $5,000 (above $30,000), as in Table 2. Hours ratios here differ slightly from those in Table 2, since the latter uses hours from all countries, whereas the current one only uses those where wage measures are available.

infer parameters for each country-year observation, and on that basis, we conduct a set of counterfactual analyses.[45] We compute the labor allocations implied by the model for each country-year and year for a counterfactual world where, one by one, we keep each parameter at its initial value for that country while using the inferred time-varying values for one particular parameter. This allows us, for example, to infer the contribution of each wedge and the gender wage gap to the observed drop in women's market work in India.

Results are reported in Table 6. The table shows, for each country and gender, the observed change in hours for each type of work, and the change attributed to each potential source, all in hours per year.

Section 4.5 showed that one pattern found in four of our five countries (Tanzania being the exception) is a decline in men's market hours, by about 0.1 to 0.2 hours a year. Table 6 shows that this mostly occurred in reaction to changes in wages and activity wedges. In Korea, the income effect from the higher wage level was the main determinant of lower market work by men, whereas a lower gender wage gap played the leading role in the US and India. At the same time, increasing activity wedges ω_i shifted work effort away from market work.

As seen above, trends in women's market work differed more across countries, as market hours worked by women increased in the US, changed little in France and Korea, and fell strongly in India and Tanzania. The counterfactual analysis shows that changes in the US and Tanzania were mostly or entirely (in the case of the US) due to changes in the gender wage gap. While smaller gender wedges also contributed in the US, they were fully offset by changes in the activity wedge. In India, women's market hours fell despite a shrinking gender wage gap, because the gender wedge doubled.

Hours of domestic service production by women steeply declined in Korea, France, and the US. In the US, the lower gender wage gap was the main contributing force to this. Again, smaller gender wedges were offset by changes in the activity wedge. In Korea, the income effect of higher wages was more important. France and Korea also saw a strong contribution from the decline in the gender wedge for domestic services. These forces pushing towards lower domestic hours by women were counteracted in all countries except for France by a greater activity wedge ω_d. Higher ω_d strongly counteracted the other forces reducing women's home hours in Korea,

[45] Parameter changes over time for each country are reported in Table 12.

and was the main contributor to higher home hours by women in Tanzania.

The other common pattern across countries observed in Section 4.5 consists in higher care hours by both women and men (with the exception of men in Tanzania). These were also due to a higher activity wedge ω_c, which overrode the push towards higher market work coming from higher wages. The exception is Tanzania, where higher wages, particularly for men, led to a decline in care hours by men, and a more accentuated gender wedge raised care hours by women.

Overall, we find strong and consistent roles for changes in wages and activity wedges in driving changes in hours worked over time. Wage increases tended to raise market work and reduce non-market work by women. For men, they tended to reduce market work and, because of the income effect, also slightly reduce non-market work. Growing activity wedges ω_i prompted a shift from market to non-market work.

The effects of changing gender wedges were more mixed. In Korea, France and the US, they shifted market work from men to women. Changes in Tanzania and India went in the opposite direction. In all countries but India, gender wedges for domestic services changed in ways that resulted in men taking on a larger role. In India, however, gender wedges underwent massive changes in the opposite directions – so large that they dominated even a very strong decline in the gender wage gap over the past two decades, leading to lower market work and increased domestic service work by women.

Table 6: Decomposition of changes in hours worked over time: main channels

Country		Change in Market Hours (h/yr)				Change in Domestic Hours (h/yr)				Change in Care Hours (h/yr)			
		Data	Wages	Gender wedge	Activity wedge	Data	Wages	Gender wedge	Activity wedge	Data	Wages	Gender wedge	Activity wedge
Tanzania	Women	-0.41	-0.19	-0.02	-0.20	0.28	0.02	-0.16	0.42	0.09	0.01	0.07	0.00
2006-2021	Men	0.07	0.11	0.01	-0.05	0.03	-0.09	0.03	0.09	-0.04	-0.04	-0.02	0.01
India	Women	-0.44	0.87	-1.19	-0.13	0.03	-1.02	0.78	0.27	0.01	-0.17	0.05	0.12
1998-2019	Men	-0.07	-0.37	0.31	-0.01	-0.08	-0.00	-0.17	0.10	0.03	-0.00	-0.03	0.07
Korea	Women	-0.16	0.02	0.37	-0.55	-0.27	-0.53	-0.52	0.78	0.06	-0.15	-0.13	0.34
1999-2009	Men	-0.24	-0.07	-0.06	-0.11	0.10	-0.16	0.10	0.16	0.06	-0.07	0.03	0.09
France	Women	0.06	0.03	0.11	-0.09	-0.53	-0.07	-0.26	-0.19	0.02	-0.01	-0.10	0.14
1999-2009	Men	-0.16	0.03	-0.05	-0.15	-0.06	-0.06	0.09	-0.08	0.07	-0.01	0.03	0.05
USA	Women	0.19	0.19	0.12	-0.13	-0.20	-0.18	-0.14	0.12	0.01	-0.05	0.00	0.06
1965-2019	Men	-0.22	-0.07	-0.04	-0.11	0.14	0.01	0.05	0.08	0.05	0.00	0.00	0.04

Note: This table shows observed changes in work over time in the columns labeled "Data", in units of hours per year. The other columns report decomposition results: they show the change in hours per year due to three bundles of factors. By construction, they add up to the change in the "Data" column.

7 Conclusion

This paper has documented that there are large differences across countries in the gender division of labor. Our descriptive analysis of the data shows interesting and consistent patterns. Some are already known: we find in the cross-country data that increases in a country's per capita GDP are associated with a weakly defined U-shape in women's market work. Perhaps less well known, we also find that women's non-market work displays a corresponding hump shape. Care work is surprisingly flat across countries, although this aggregate finding conceals important compositional changes. We document a consistent downward pattern in men's market work and significant increases in men's care and domestic services.

What is most striking, however, in the cross-country data is the wide dispersion in country experiences. Where much of the prior literature has focused on documenting patterns that relate to income per capita (and implicitly also to the sectoral movements that accompany the growth process), we find the dispersion to be at least as interesting. We argue that this

dispersion is a first-order matter, especially for a set of middle-income countries. This variation does not appear to be random; instead, it seems to arise from embedded social and economic structures that characterize different economies – mediated, through laws, policies, institutions, and norms. All of these are malleable, at least in the long run.

Our analysis allows us to quantify the impact of these structures, as represented by a set of macroeconomic wedges, akin to differential taxes on the market earnings of men and women. These wedges play an important role in accounting for the disparate patterns of time use that we observe. The wedges are, in a sense, a reduced form representation of a broad set of policies and structural constraints that disadvantage women. We show that these wedges are quantitatively and qualitatively important in accounting for the observed patterns in the data – both in the cross-section and in the time series for a set of countries where we have available data.

The implication of our analysis is clear. Some (and perhaps many) of the factors shaping the gender division of work can be influenced by social and political choices. Others may be more deeply embedded (for example, in patriarchal structures of power). However, in the cross-section of countries, income per capita is not a leading determinant of the gender division of work.

Will future income growth drive convergence in the gender division of work? It is striking that the dispersion in gendered patterns is much lower in high-income countries than in middle-income countries, and this could be indicative of a tendency for countries to see convergence in their gender wedges due to growth and structural transformation. But a different interpretation of the data might suggest that growth and structural transformation are themselves affected by the size of gender wedges. Perhaps the growth of the service sector, for instance, depends (as in Ngai and Petrongolo, 2017) on the ability of women to move with few frictions from domestic service work to market work. Perhaps the misallocation of talent described by Hsieh et al. (2019) is similarly an impediment to growth.

Answering questions like these will require a different set of models and empirical studies that can build on the evidence presented here. Questions remain regarding the implications for growth and development. Fortunately, this is an active area of research; the importance of gender in macro and growth economics is becoming more evident as the field expands.

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A Data sources

Table 7: Time Use Surveys

Country	Year	Survey name	Number of diaries
Albania	2010	Albanian Time Use Survey	32'064
Argentina	2021	Encuesta Nacional de Uso del Tiempo	46'772
Armenia	2008	Time use sample survey in Armenia	9'260
Australia	2006	Centre for Time Use Research	44'032
Austria	2008	Centre for Time Use Research	25'124
Bangladesh	2012	Time Use Study	75'144
Belgium	2013	Harmonized European Time Use Survey	33'704
Benin	2015	Enguête Modulaire Intégrée sur les Conditions de Vie au Bénin	3'348
Cambodia	2019	Living Standard Measurement Survey	13'124
Cameroon	2014	Cameroon Household Survey	33'268
Canada	2010	Centre for Time Use Research	46'288
Chile	2007	Encuesta Uso de Tiempo	9'640
China	2008	China Time Use Survey	281'296
Denmark	2001	Centre for Time Use Research	23'676
Egypt	2015	Time Use Survey	11'556
El Salvador	2017	Encuesta Nacional de Uso del Tiempo	16'512
Estonia	2009	Harmonized European Time Use Survey	27'768
Ethiopia	2013	Ethiopian Time Use Survey	168'172
Finland	2009	Harmonized European Time Use Survey	20'956
France	1985	Centre for Time Use Research	57'232
France	1999	Enquête Emploi du Temps	50'400
France	2009	Enquête Emploi du Temps	86'440
Germany	2012	Zeitverwendungserhebung (ZVE)	82'820
Ghana	2009	Ghana Time Use Survey	21'232
Greece	2013	Harmonized European Time Use Survey	35'208
Hungary	2009	Harmonized European Time Use Survey	24'796
India	1998	Time Use Survey	232'804
India	2019	Time Use Survey	1'435'052
Iraq	2007	Household Socio-Economic Survey	77'568
Israel	1991	Centre for Time Use Research	16'096
Italy	2013	Uso del tempo	108'140
Japan	2006	Survey on Time Use and Leisure Activities	40'532
Kosovo	2017	Kosovo Workforce and Time Use Survey	32'516
Luxembourg	2014	Harmonized European Time Use Survey	13'476
Mongolia	2019	Time Use Survey	51'080
Morocco	2012	Time Use Survey	60'764
Netherlands	2011	Harmonized European Time Use Survey	38'360
Nicaragua	1999	Living Standard Measurement Survey	22'392
Norway	2010	Harmonized European Time Use Survey	23'032
Pakistan	2007	Time Use Survey	119'948
Palestinian Territories	2012	Time Use Survey	28'940
Poland	2013	Harmonized European Time Use Survey	229'092
Romania	2011	Harmonized European Time Use Survey	150'640
Serbia	2015	Seasonnal research on the use of time	14'596
South Africa	2010	Time Use Survey	117'176
South Korea	1999	Centre for Time Use Research	283'404
South Korea	2009	Centre for Time Use Research	125'864
Spain	2009	Harmonized European Time Use Survey	55'292
Sri Lanka	2017	Sri Lanka time use survey	48'628
Tanzania	2006	Integrated Labour Force Survey	175'000
Tanzania	2014	Integrated Labour Force Survey	34'292
Tanzania	2021	Integrated Labour Force Survey	31'952
Turkey	2015	Time Use Survey	160'688
Uganda	2018	National Panel Survey	15'740
United Kingdom	2014	Harmonized European Time Use Survey	43'560
United States	1965	Multinational Comparative Time-Budget Research Project as part of AHTUS	7'956
United States	1975	American's Use of Time: Time Use in Economic and Social Accounts as part of AHTUS	15'016
United States	1985	American's Use of Time as part of AHTUS	10'172
United States	2003	American Time Use Survey	69'964
United States	2004	American Time Use Survey	46'788
United States	2005	American Time Use Survey	44'144
United States	2006	American Time Use Survey	43'428
United States	2007	American Time Use Survey	40'988
United States	2008	American Time Use Survey	42'572
United States	2009	American Time Use Survey	43'608
United States	2010	American Time Use Survey	44'052
United States	2011	American Time Use Survey	40'996
United States	2012	American Time Use Survey	40'600
United States	2013	American Time Use Survey	36'668
United States	2014	American Time Use Survey	36'952
United States	2015	American Time Use Survey	34'696
United States	2016	American Time Use Survey	32'656
United States	2017	American Time Use Survey	31'532
United States	2018	American Time Use Survey	28'980
United States	2019	American Time Use Survey	28'012
United States	2020	American Time Use Survey	25'872
United States	2021	American Time Use Survey	26'348

Table 8: Household and Labor Force Surveys

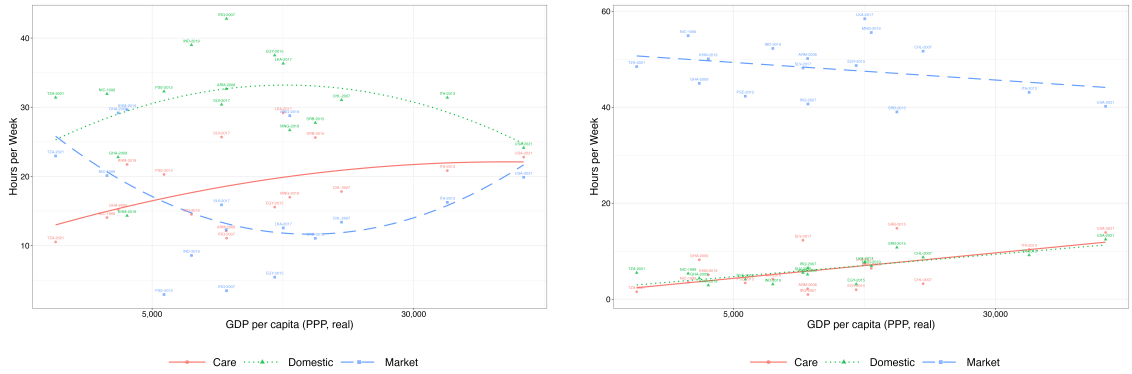
Country	Year	Survey name
Albania	2010	Labour Force Survey
Argentina	2019	Encuesta Permanente de Hogares
Armenia	2008	Integrated Living Conditions Survey
Australia	2006	Household, Income and Labour Dynamics in Australia
Austria	2008	European Union Statistics on Income and Living Conditions
Belgium	2013	European Union Statistics on Income and Living Conditions
Benin	2015	Enquête Modulaire Intégrée sur les Conditions de Vie des ménages
Cambodia	2019	Cambodia Labor Force Survey
Cameroon	2014	Fourth Cameroon Household Survey
Canada	2010	Labour Force Survey
Chile	2006	Encuesta de Caracterización Socioeconómica Nacional
China	2012	Family Panel Studies
Denmark	2004	European Union Statistics on Income and Living Conditions
Egypt	2015	Harmonized Labor Force Survey
Estonia	2009	European Union Statistics on Income and Living Conditions
Ethiopia	2013	National Labour Force Survey
Finland	2009	European Union Statistics on Income and Living Conditions
France	2003	Enquête emploi annuelle
France	2009	European Union Statistics on Income and Living Conditions
France	2009	Enquête emploi annuelle
Germany	2012	European Union Statistics on Income and Living Conditions
Ghana	2008	Living Standard Survey
Greece	2013	European Union Statistics on Income and Living Conditions
Hungary	2009	European Union Statistics on Income and Living Conditions
India	1999	Indian National Sample Survey
India	2019	Periodic Labor Force Survey
Iraq	2007	Household Socio-Economic Survey
Italy	2013	European Union Statistics on Income and Living Conditions
Japan	2007	Employment Status Survey
Luxembourg	2014	European Union Statistics on Income and Living Conditions
Mongolia	2019	Labor Force Survey
Netherlands	2011	European Union Statistics on Income and Living Conditions
Norway	2010	European Union Statistics on Income and Living Conditions
Pakistan	2007	Social & Living Standards Measurement
Palestinian Territories	2012	Hamonized Labor Force Survey
Poland	2013	European Union Statistics on Income and Living Conditions
Romania	2011	European Union Statistics on Income and Living Conditions
Serbia	2015	European Union Statistics on Income and Living Conditions
South Africa	2010	Labor Market Dynamics
South Korea	1999	Korean Labor and Income Panel Study
South Korea	2009	Korean Labor and Income Panel Study
Spain	2009	European Union Statistics on Income and Living Conditions
Sri Lanka	2017	Labor Force Survey
Tanzania	2006	Integrated Labour Force Survey
Tanzania	2014	Integrated Labour Force Survey
Tanzania	2021	Integrated Labour Force Survey
Uganda	2018	Uganda National Panel Survey
United Kingdom	2014	European Union Statistics on Income and Living Conditions
United States	1967	Current Population Survey
United States	1975	Current Population Survey
United States	1985	Current Population Survey
United States	2003	Current Population Survey
United States	2004	Current Population Survey
United States	2005	Current Population Survey
United States	2006	Current Population Survey
United States	2007	Current Population Survey
United States	2008	Current Population Survey
United States	2009	Current Population Survey
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United States	2012	Current Population Survey
United States	2013	Current Population Survey
United States	2014	Current Population Survey
United States	2015	Current Population Survey
United States	2016	Current Population Survey
United States	2017	Current Population Survey
United States	2018	Current Population Survey
United States	2019	Current Population Survey
United States	2020	Current Population Survey
United States	2021	Current Population Survey

Table 9: World Values Survey (WVS) questions

Label	Question/Statement
"Main Index"	WVS Gender Equality Index
"Job"	"Men should have more right to a job than women do."
"Politics"	"Men make better political leaders than women do."
"Education"	"University education is more important for a boy than for a girl."
"Secular values"	WVS Overall Secular Values Index
"Abortion"	Is abortion justifiable?
"Divorce"	Is divorce justifiable?

B Cross-country Patterns of Hours Worked

B.1 Hours worked of married individuals that live in a household with a pre-school child



(a) Married Women

(b) Married Men

Figure 6: Average Hours Worked for married working-age individuals that live in a household with at least one child under the age of 5.

B.2 Population composition and hours of work

There are considerable differences in the composition of the married working-age population across countries. For instance, the working-age population in low-income countries is younger and less skilled, which could drive the observed patterns in hours worked. To evaluate how these factors affect the facts documented above, we exploit the micro-data, in particular, the information on individual demographics and education.

We compute a composition-adjusted measure of hours worked for each country. For this, we first create consistent age and skill groups in the microdata and compute hours worked for each type of work and gender for each age × skill group. We then compute composition-adjusted aggregate hours of work for married women and men in all countries using the population shares of a fixed reference country instead of each country's own population shares.

To do so, we split each country's population into two age groups and two skill groups. The two age groups are above and below 40 years of age. The low-skilled are those with less than 12 years of schooling, and the high-skilled are those with 12 or more.[46] Table 10 shows results from this exercise when using the US in 2015 as the reference country. A comparison of Tables 2 and

[46] If information on the years of education is missing, we use data on the highest completed degree. Individuals who completed a high-school degree and above are then considered high-skilled.

10 shows that the facts documented above are unaffected by the composition adjustment. Cross-country patterns of hours worked for men are unaffected. Similarly, women's market hours are slightly U-shaped, and domestic hours slightly hump-shaped, as above. While the difference between mean market hours worked by women in middle- and high-income countries shrinks slightly, the difference in the ratio of women's to men's market hours between these country groups remains large. The hump-shaped pattern in hours women spent producing domestic services is also preserved, and the ratio of women's to men's care hours is much higher in poor and middle-income countries.

Table 10: Composition-adjusted Hours Worked using US 2015 Population Shares

		Country Income Group			All countries	
Work type		LIC	MIC	HIC	Mean	$\varepsilon(\text{hours}, \ln y)$
Market	Women	29.45	20.68	22.89	23.20	-0.01
		(10.18)	(7.96)	(2.40)	(7.92)	(0.06)
	Men	44.91	43.20	38.74	42.16	-0.06
		(4.22)	(6.47)	(6.70)	(6.50)	(0.02)
Domestic	Women	22.57	30.64	26.36	27.62	0.03
		(6.01)	(5.90)	(3.88)	(6.17)	(0.03)
	Men	4.54	8.96	13.37	9.42	0.40
		(1.57)	(3.85)	(3.55)	(4.62)	(0.05)
Care	Women	7.13	9.07	8.41	8.46	0.07
		(1.90)	(3.37)	(1.50)	(2.69)	(0.04)
	Men	3.16	3.41	4.71	3.77	0.27
		(2.24)	(1.77)	(1.49)	(1.88)	(0.08)

Note: This table reports the composition-adjusted weekly hours worked per married adult in market, domestic, and care activities by country income group and across countries, imposing on all countries the skill and age distribution of the US in 2015. Columns 1 to 3 report these numbers by country income group, namely low-income (LIC), middle-income (MIC), and high-income country (HIC). Column 5 reports the elasticity of each hours worked series with respect to GDP per capita (PPP). The numbers in parentheses are standard deviations for columns (1) to (4). In column 5, these numbers are standard errors.

Overall, the relationship between all three types of work and country income level is somewhat weaker in composition-adjusted data, but all relationships documented above persist.

C Model Derivations and Extensions

C.1 Derivation of the Frisch elasticity.

Combining the first-order conditions of market work and consumption yields

$$D_m^g {L_m^g}^{-\frac{1}{\rho}} L^{g\,\frac{1}{\phi}+\frac{1}{\rho}} = w^g {c_m^g}^{-\frac{1}{\varepsilon}} c^{g\,\frac{1-\sigma\varepsilon}{\varepsilon}}, \tag{23}$$

On the left-hand side, market work L_m^g appears both directly and within L^g. Denote the left (right) hand side of the equation as LHS (RHS), with $LHS = RHS$. Since

$$\frac{\partial LHS}{\partial L_m^g} dL_m^g = \frac{\partial RHS}{\partial w^g} dw^g, \tag{24}$$

the compensated elasticity of L_m^g with respect to w^g is

$$\frac{\mathrm{d}L_m^g}{\mathrm{d}w^g}\frac{w^g}{L_m^g} = \left[\frac{\partial LHS}{\partial L_m^g} L_m^g\right]^{-1} \frac{\partial RHS}{\partial w^g} w^g. \tag{25}$$

Further algebra leads to the following expression for the Frisch elasticity

$$\left[-\frac{1}{\rho}+\left(\frac{1}{\phi}+\frac{1}{\rho}\right)\Theta_m^{g\,\frac{1-\rho}{\rho}}\right]^{-1}. \tag{26}$$

C.2 Model extensions

C.2.1 Market substitutes for home services

Suppose that households can also purchase substitutes for home services in the market. Denote these by c_s and their price by p_s. Suppose that these enter the consumption aggregator with a weight B_s, and have the same elasticity of substitution with home services as other market goods do. The consumption aggregator then becomes

$$C=\left[c_m^{\frac{\varepsilon-1}{\varepsilon}}+B_d c_d^{\frac{\varepsilon-1}{\varepsilon}}+B_c c_c^{\frac{\varepsilon-1}{\varepsilon}}+B_s c_s^{\frac{\varepsilon-1}{\varepsilon}}\right]^{\frac{\varepsilon}{\varepsilon-1}}.$$

The household budget constraint then is

$$\sum_g c_m^g+p_s c_s^g=\sum_g w^g L_m^g.$$

At optimal consumption choices,

$$c_s=\left(\frac{B_s}{p_s}\right)^{\varepsilon} c_m.$$

Using this, the objective becomes

$$C=\left[c_m^{\frac{\varepsilon-1}{\varepsilon}}+B_d c_d^{\frac{\varepsilon-1}{\varepsilon}}+B_c c_c^{\frac{\varepsilon-1}{\varepsilon}}+B_s c_s^{\frac{\varepsilon-1}{\varepsilon}}\right]^{\frac{\varepsilon}{\varepsilon-1}}=\left[(1+p_s^{1-\varepsilon}B_s^{\varepsilon})c_m^{\frac{\varepsilon-1}{\varepsilon}}+B_d c_d^{\frac{\varepsilon-1}{\varepsilon}}+B_c c_c^{\frac{\varepsilon-1}{\varepsilon}}\right]^{\frac{\varepsilon}{\varepsilon-1}}.$$

Then equation (21) becomes

$$\omega_i=(1+p_s^{1-\varepsilon}B_s^{\varepsilon})w^{m\,\frac{\varepsilon-1}{\varepsilon}}\left(\frac{L_i^m}{L_m^m}\right)^{\frac{1}{\varepsilon}-\frac{1}{\rho}}\left(\frac{(w^f L_m^f)/(w^m L_m^m)+1}{L_i^f/L_i^m+1}\right)^{-\frac{1}{\varepsilon}},\quad i=c,d, \tag{27}$$

so that

$$\omega_i^{\text{benchmark}}=\frac{\omega_i^{\text{substitutes}}}{1+p_s^{1-\varepsilon}B_s^{\varepsilon}}. \tag{28}$$

For $\varepsilon>1$, this implies that measured productive efficiency of non-market work increases in true productive efficiency of market services, $\omega_d^{\text{substitutes}}$, falls in the preference for substitutes, B_s, and increases in the price of substitutes, p_s. Our finding of high ω_d in rich countries could thus reflect high p_s.

C.2.2 Appliances

Suppose that in addition to labor, each household member can use capital to produce domestic services with the production function

$$y_d^g=z\left[\alpha(k_d^g)^{\frac{\eta-1}{\eta}}+(1-\alpha)(L_d^g)^{\frac{\eta-1}{\eta}}\right]^{\frac{\eta}{\eta-1}}. \tag{29}$$

Households rent their capital input $k_d = k_d^f + k_d^m$ at a rental rate r as in Greenwood et al. (2005) (hereafter GSY). Then, the household budget constraints become

$$\sum_g c_m^g = \sum_g w^g L_m^g - r k_d \quad \text{and} \quad \sum_g c_d^g = \sum y_d^g. \tag{30}$$

Optimal input use requires equating the marginal product of capital for each household member to the rental rate, adjusting for the shadow values of domestic services and market goods, υ_d and υ_m. Hence

$$z\alpha \left(\frac{y_d^g / z}{k_d^g} \right)^{\frac{1}{\eta}} \upsilon_d = r \upsilon_m. \tag{31}$$

Because both household members face the same rental rate and shadow values, the average product of capital, as well as the capital-labor ratio, is equated across household members. The optimal capital-labor ratio equals

$$\frac{k_d^g}{L_d^g} = \left[\frac{1-\alpha}{\left(\frac{r\upsilon_m}{z\alpha\upsilon_d} \right)^{\eta-1} - \alpha} \right]^{\frac{\eta}{\eta-1}}. \tag{32}$$

For a given marginal utility, it decreases in the rental rate r.

Using this, the first-order condition for hours spent producing domestic services becomes

$$D_d^g (L_d^g)^{-\frac{1}{\rho}} (L^g)^{\frac{1}{\phi}+\frac{1}{\rho}} = \upsilon_d z (1-\alpha)^{\frac{\eta}{\eta-1}} \left[\frac{\alpha}{1-\alpha} \left(\frac{k_d^g}{L_d^g} \right)^{\frac{\eta-1}{\eta}} + 1 \right]^{\frac{1}{\eta-1}}, \tag{33}$$

where the last terms on the right-hand side capture the marginal product of labor in the presence of appliances.

The other first-order conditions are unchanged. Then, the ratio of the first order condition for market goods to that for domestic services implies that the optimal hours allocation across activities for women is given by

$$\left(\frac{L_m^f}{L_d^f} \right)^{\frac{1}{\varepsilon}-\frac{1}{\rho}} = \frac{w^{f\,\frac{\varepsilon-1}{\varepsilon}}}{\omega_d (1-\alpha)^{\frac{\eta}{\eta-1}\frac{\varepsilon-1}{\varepsilon}}} \frac{D_d^f}{D_m^f} \left(\frac{(w^m L_m^m)/(w^f L_m^f) + 1 - rk/(w^f L_m^f)}{L_d^m / L_d^f + 1} \right)^{-\frac{1}{\varepsilon}} \left[\frac{\alpha}{1-\alpha} \left(\frac{k_d^g}{L_d^g} \right)^{\frac{\eta-1}{\eta}} + 1 \right]^{\frac{\eta}{\eta-1}\left(\frac{1}{\varepsilon}-\frac{1}{\eta}\right)}$$

GSY argue that a decline in the cost of appliances has contributed to the increase in women's market work in the US over the 20th century. Our model features the same channel: If $\eta > \varepsilon$ (and $\eta > 1$), greater use of appliances (induced by lower r) implies greater market work relative to time spent producing domestic services. This occurs if capital and labor are sufficiently substitutable in production ($\eta > \varepsilon$). The same channel is at work for men.[47]

Comparing the previous equation to equation (12) in the main text shows that

$$\omega_d{}^{\text{benchmark}} = \omega_d{}^{\text{appliances}} (1-\alpha)^{\frac{\eta}{\eta-1}\frac{\varepsilon-1}{\varepsilon}} \left[\frac{\alpha}{1-\alpha} \left(\frac{k_d^g}{L_d^g} \right)^{\frac{\eta-1}{\eta}} + 1 \right]^{\frac{\eta}{\eta-1}\left(\frac{1}{\eta}-\frac{1}{\varepsilon}\right)}, \tag{34}$$

[47] If capital and labor were more complementary in the production of domestic services ($\eta < \varepsilon$), then greater appliance use would raise the marginal product of domestic labor so much as to attract labor into the production of domestic services, leading to a decline in L_m^f / L_d^f.

neglecting the empirically small term rk/L_m^f capturing the cost of appliances.

How does this term affect cross-country comparisons? We find greater ${\omega_d}^{\text{benchmark}}$ in richer countries. The findings here indicate that if one considers appliances, assumes $\eta > \varepsilon$, and appliances are cheaper in richer countries, then the cross-country dispersion in ${\omega_d}^{\text{appliances}}$ needs to be even larger than that in ${\omega_d}^{\text{benchmark}}$. Essentially, the fact that appliances are cheaper in rich countries reduces optimal domestic service input on its own. So if we see higher domestic services hours in rich countries, this is *despite* the presence of cheaper appliances, and so ${\omega_d}^{\text{appliances}}$ must have an even steeper gradient with respect to country income per capita than ${\omega_d}^{\text{benchmark}}$.

D Additional results and robustness

D.1 Correlation of gender wedges with religion

Table 11: Correlation of Gender Wedges with Religion

	Market (μ)	Domestic (δ)	Care (κ)
Buddhism	-0.07	-0.06	-0.10
Christian Japanese	-0.11	0.06	0.06
Christianity	-0.31	0.26	0.13
Hinduism	0.17	-0.20	0.16
Islam	0.70	-0.48	-0.34
Judaism	-0.12	0.11	0.16
No religion	-0.37	0.51	0.31
Other religion	-0.21	-0.15	-0.18
Sikhism	0.08	0.00	0.22

*Note:*This table reports the correlation of the estimated gender wedges in market (μ), domestic (δ), and care (κ) work with the population shares of religious groups as provided by the UN or the World Religion Project (Maoz and Henderson, 2013).

D.2 Additional results on changes over time

Country	μ	δ	κ	ω_d	ω_c
Tanzania	0.14	0.46	-0.51	1.6	0.5
India	3.29	-0.51	0.64	1.24	2.74
Korea	-0.63	1.24	0.83	3.6	4.54
France	-0.04	0.69	1.09	-0.17	2.2
United States	-0.24	0.25	-0.05	0.74	1.02

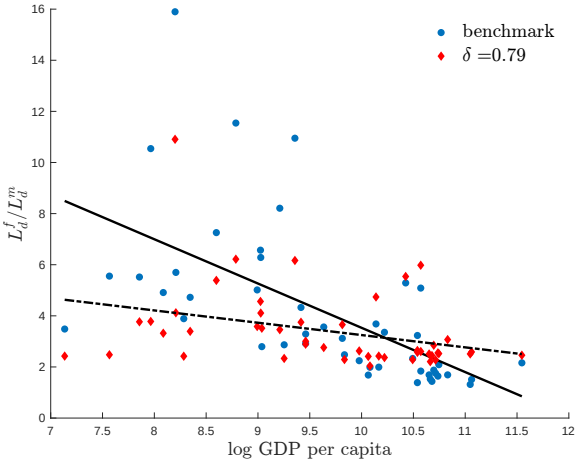
Table 12: Change in parameters over time for five countries (% change per year)

D.3 Additional results on cross-country differences

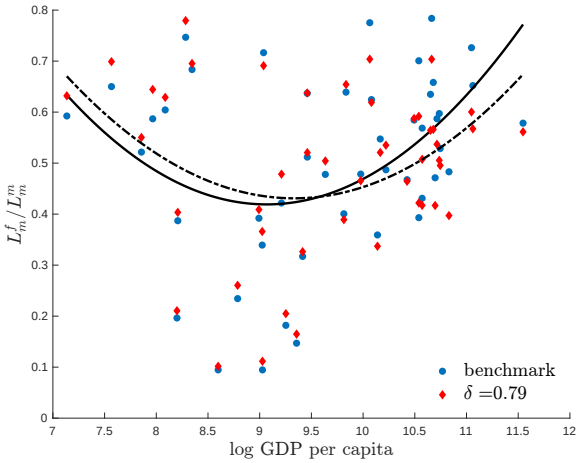
	Panel (a): Mean L_d^f/L_d^m by country income group			*Panel (b):* Mean L_c^f/L_c^m by country income group		
	LIC	MIC	HIC	LIC	MIC	HIC
data	6.69	4.58	2.23	3.77	3.43	1.99
Counterfactual economies:						
common w^f/w^m	5.74	4.87	1.85	3.39	3.72	1.67
common μ	7.63	3.81	2.72	4.39	2.88	2.44
common δ	4.07	3.54	2.92	4.01	3.64	1.83
common κ	6.68	4.6	2.2	3	2.67	2.47

Table 13: Accounting for the cross-country dispersion of domestic services and care work: Counterfactual mean L_d^f/L_d^m and L_c^f/L_c^m by country income group

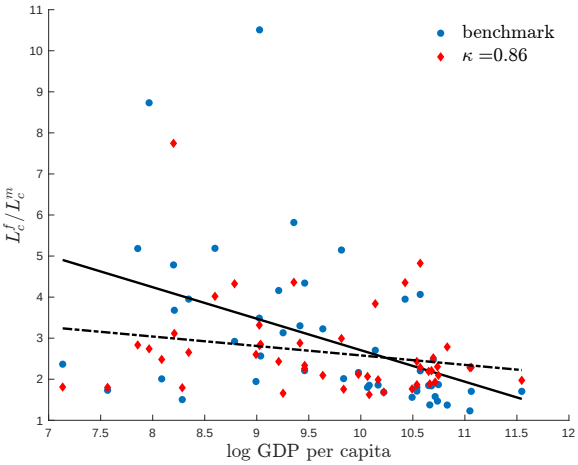
D.4 Additional results on cross-country differences



(a) Domestic hours: common domestic wedge δ



(b) Market hours: common domestic wedge δ



(c) Care hours: common care wedge κ

Figure 7: **Counterfactuals with respect to gender wedges.** In each figure, data are in blue and counterfactual outcomes in red. Figure 7a shows the gender ratio of domestic hours against GDP per capita, Figure 7b shows that of market hours, and Figure 7c shows care hours for common κ. The full (dashed) line is a line of best fit for the benchmark (counterfactual). In figures 7a and 7b the counterfactual consists in setting the gender wedge of domestic services in all countries to 0.79. In figures 7c the counterfactual consists in setting the gender wedge of care work services in all countries to 0.86.