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Home hours in the United States and Europe

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Abstract: Using data from the Multinational Time Use Study, this paper documents the trend and level of time allocation, with a focus on home hours, for the US and European countries. Three patterns emerge. First, home hours per person have declined in both the US and European countries over the past 50 years. Second, female time allocation contributes more to the difference in time allocation per person between the US and European countries than does male time allocation. Third, the time allocation between the US and European countries is more similar for prime-age individuals than for young and old individuals.

Keywords: age; gender; home hours; time use.

JEL Classification: J22; D13.

1 Introduction

Based on field research, Kahneman and Krueger (2006) find that different activities of everyday life provide different levels of happiness. Hence, studying the time allocation for different activities is important. As a subcategory of time allocation, market work has been studied extensively in the literature. By contrast, studies on home work are limited due to a lack of data availability until recently.¹ The allocation of time for home activities is not only interesting in itself but also important in facilitating the understanding of market activities.² Indeed, one stream in the literature has demonstrated that the inclusion of home production improves the performance of standard models in accounting for business

1 Recent papers that examine home hours include Aguiar and Hurst (2007), Ramey and Francis (2009), Ramey (2009), Freeman et al. (2005), Burda, Hamermesh, and Weil (2008), Ragan (2013), Ngai and Pissarides (2011), and Gimenez-Nadal and Sevilla (2012).

2 Alexopoulos and Cavalcanti (2010) find that home production is also important in understanding the problem of the persistence of inequality.

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cycle fluctuation.³ Another stream in the literature finds that home production is important in accounting for the market labor supply difference between the US and Europe.⁴ In light of the importance of home work, this paper studies the trend and level of home hours for the US and European countries.

We construct measures of home work, market work, and total work in each decade from the 1960s to the 2000s using the data from the Multinational time use study (MTUS). We find that the core home hours (i.e. household work, such as cooking, cleaning, and laundry) have declined in both the US and European countries since the 1960s. Americans spend the least amount of time on core home work than other nationals in all five decades.⁵ Over the sample period, men have generally decreased their market hours and increased their home hours, whereas women in all countries have increased their market hours and decreased their home hours. This shift leads to a significant reduction in the gender gap in market hours and home hours. We also find that the time that men and women devote to their children has increased in most of the countries studied.

More importantly, we find that cross-country differences in time allocation are largely driven by the time allocation decision of women. This finding is established from the following observations. First, the cross-country dispersion in female market hours is much larger than the dispersion in male market hours. Second, the declining trend in home hours per person is entirely driven by the decline in female home hours because male home hours have increased in all countries. Third, the countries with larger declines in home hours per person generally have larger declines in female home hours. Fourth, the cross-country difference in home hours is larger for women than it is for men in the 2000s.

We also examine time allocation by age group. Home hours have declined across all age groups in all of countries studied. Men of all age groups have increased their home hours, and women of all age groups have decreased their home hours. Hence, the decline in female home hours also drives the decline in home hours per person for each age group. Furthermore, we find that the time allocation of all three categories, namely, home work, market work, and total work, are more similar for the prime-age group than for the young and old groups between the US and European countries. The reason is mainly the employment to population ratio is more similar for the prime-age group between the US and European countries. We also find that, across countries, decades, and genders,

³ For examples, see Greenwood and Hercowitz (1991), Benhabib, Rogerson, and Wright (1991), McGrattan, Rogerson, and Wright (1997), and Campbell and Ludvigson (2001).

⁴ For examples, see Greenwood and Hercowitz (1991), Benhabib, Rogerson, and Wright (1991), McGrattan, Rogerson and Wright (1997), and Campbell and Ludvigson (2001).

⁵ The Netherlands in the 1970s is an exception.

young individuals spend less time and old individuals spend more time on home production than do prime-age individuals. Finally, total work has declined for all age groups of both genders. The smallest and largest declines are found for the prime-age group and the young group, respectively.

1.1 Related literature

This paper is closely related to the literature on the documentation of time allocations. Ramey (2009) and Bianchi et al. (2000) find that home hours in the US have declined over time. Ramey and Francis (2009) find that leisure in the US has increased. Aguiar and Hurst (2007) construct measures of time allocation for the US and focus on how leisure has changed within demographic groups.⁶ Sevilla, Gimenez-Nadal, and Gershuny (2012) study the trend in the quality of leisure for the US. All five of these papers study time allocation for the US. Several other studies examine time allocation in multiple countries. Freeman et al. (2005) study time allocation for the US and a few European countries in the early 1990s. Ragan (2013) and Ngai and Pissarides (2011) study more countries, but their analysis is only for the 2000s. Burda, Hamermesh, and Weil (2008) and Burda, Hamermesh, and Weil (2013) examine total work by gender for a group of countries. These papers, which study time allocation in both the US and Europe, focus on only recent periods, and therefore, they have no trend implications.

Following Aguiar and Hurst (2007), Gimenez-Nadal and Sevilla (2012) construct data for several industrialized countries other than the United States, but their focus is primarily on how leisure changes over time for different demographic groups within a country. By contrast, we focus on analyzing the trend and level differences in home hours between the US and European countries. We also demonstrate that the cross-country differences in time allocation are largely driven by the cross-country differences in the time allocation of women and non-prime-age individuals.

We find that both men and women have increased the time they spend on child care in the countries studied. This finding is consistent with Bianchi (2000), Sayer, Bianchi and Robinson (2004), Ramey and Ramey (2010), and Gauthier, Smeeding and Furstenberg (2004).⁷ The first three papers find that the time spent

⁶ The web Appendix D compares our estimates for the US to estimates from Aguiar and Hurst (2007).

⁷ Guryan, Hurst, and Kearney (2008) find that more educated parents spend more time with their children.

on child care has increased in the US and the last paper finds that the time spent on child care has increased in a group of industrialized countries.

The decline in female home hours is closely related to the increase in the female labor force participation rate. The literature has found that factors such as improvement in the home production productivity [Greenwood, Seshadri, and Yorukoglu (2005), Cavalcanti and Tavares (2008), and Greenwood, Guner, and Vandenbroucke (Forthcoming)], increases in the supply of government services [Cavalcanti and Tavares (2011)], changes in social norms [Fogli and Veldkamp (2011) and Fernandez (2013)], and gender-biased demand shift [Galor and Weil (1996), Heathcote, Storesletten, and Violante (2010), and Ngai and Petrongolo (2014)] are all important in accounting for the rise in the female labor force participation rate and therefore the decline in female home hours.⁸

This paper is also related to the literature that attempts to account for the difference in market hours between the US and Europe using models with home production [Ragan (2013), Rogerson (2008), Ngai and Pissarides (2008), Ngai and Pissarides (2011), and McDaniel (2011)]. In principle, a successful model should generate predictions for both market and home hours that are consistent with the data. Our constructed home hours are useful in this regard because our estimates can be used to calibrate and evaluate the theoretical models.

The rest of the paper is organized as follows. Section 2 discusses the data and methodology. Section 3 presents our estimates. Section 4 concludes.

2 Data

2.1 Data and methodology

We use data from the Multinational Time Use Study (MTUS) to construct our estimates of time allocation. The MTUS is an ongoing project with the intent of harmonizing the time use data collected by different statistical agencies in different countries. Because the project is ongoing, there are different releases of the time use data. When possible, we use the most recent release.⁹ Table 1 presents the country name, year, and number of observations for each survey included in our sample. The details for each survey are available in the web Appendix F.

⁸ Goldin (1990) and Costa (2000) summarize the various factors behind the rise in married female labor force participation rate.

⁹ The estimates in this paper come from the W5.0, W55.2, W55.3, and W6.0 releases.

Table 1: MTUS countries and years.

Survey	Observations	Survey	Observations
France		Norway	
1966*	2898	1971	5467
1974*	4633	1981	3966
1998	12,388	1990	19,997
Germany		1995	19,740
1965*	2137	2000	10,346
1991	21,792	United Kingdom	
2001	27,318	1974	14,372
Italy		1981	3966
1979*	2116	1990	5266
1989	13,027	1995	19,740
2002	35,571	2000	13,346
Netherlands		2005	3622
1975	7803	United States	
1980	16,350	1965	1948
1985	19,462	1975	1949
1990	19,997	1985	2539
1995	19,740	1992	6556
2000	10,346	2003	38,511
2005	12,335	2005	21,004

*5.0 release, ages 20–59 only.

The MTUS dataset contains diary entries in which each respondent reports the time spent on standard activities. Each entry also contains information on the date, day of the week, and demographic characteristics of the respondent. In surveys in which a diarist records activities on multiple days, each diary entry is treated as unique. We divide the data by age group (15–19, 20–24, 25–34, 35–44, 45–54, 55–59, and 60–64), gender, and labor market status (active/inactive). We then calculate the average hours per week spent on each activity for each demographic group.¹⁰

Because the surveyed population may not reflect the composition of the actual population, we construct weights based on gender, age and labor market status and

10 Several surveys are only available in the release of the 5.0 format. This release includes only individuals aged 20–59. For the results reported in the main text, we assume that the members of the 15–19 age group spend the same number of weekly hours on each activity as their demographic counterparts in the 20–24 age group. We use the same procedure for individuals aged 60–64 but use the 55–59 age group as the reference group. We make a similar assumption if only part of an age group is available. In the web Appendix E, we examine two alternative scenarios to construct the estimates. The results are close to those reported in the paper.

calculate the weighted average of the time spent on each activity using the constructed weights. We construct the weights from the *OECD Labor Force Statistics* (whenever available; see the country notes in the web Appendix F).¹¹ We also weight the diary observations such that the days of the week are equally represented across the survey.

Aguiar and Hurst (2007) and Gimenez-Nadal and Sevilla (2012) construct measures of time allocation while holding the demographic composition (age, gender, educational attainment and the presence of children) of the population constant over time. However, demographics are not necessarily similar across countries at a given point in time, and the changes in demographics over time are also not necessarily similar across countries. Thus, although a constant demographic weighting scheme is ideal in studying how different time allocations change across demographic groups within a country, it is not appropriate for comparing time allocations across countries. Specifically, under the constant demographic weighting scheme, the time allocation level does not reflect the actual time allocation level for an average person in a given country and decade. Hence, we cannot compare time allocation levels across countries in a given decade. Furthermore, aggregate data from the Groningen Growth and Development Center (GGDC) show that a large part of the difference in market hours per person between the US and European countries is due to the difference in the employment to population ratio. The MTUS data also show that home hours differ substantially for employed and non-employed individuals. Hence, it is important to weight the data by labor market status when comparing time allocations between the US and European countries.

2.2 Activity categories

To harmonize the time use surveys, the MTUS groups the activities in each individual survey into standard categories. We construct the measures of market work and home work from the 41 standard activity categories.¹² Table 2 reports each of the 41 activities. We follow the classification of market work and home work by Aguiar and

11 Although it may be ideal to construct more detailed demographic groups, a consistent source for constructing weights is not available. Each survey includes suggested survey weights, but we choose not to use these weights because some surveys provide weights only for age groups and others for finer categories.

12 The most recent MTUS releases contain two sets of activity categories: a set of 41 activities and a set of 69 more narrowly defined activities. The 69-activity typology is not available for all of the countries studied. Thus, we must use the 41 activity codes. However, we are able to use the 69-activity typology when comparing our results for the US with those of Aguiar and Hurst (2007) in the web Appendix D. We also demonstrate how the estimates change for the US when we switch to the 41-activity typology.

Table 2: MTUS activities.

Core market work		Leisure continued	
AV 1	Paid work, primary job	AV 19	Active sports participation
AV 2	Paid work at home	AV 20	Passive sports participation
AV 3	Paid work, second job	AV 21	Walking
Total market work=core+		AV 22	Religious activities
AV 5	Travel to/from work	AV 23	Civic activities
Core non-market		AV 24	Cinema or theater
AV 6	Cook, wash up	AV 25	Dances or parties
AV 7	Housework	AV 26	Social clubs
Shopping		AV 27	Pubs
AV 10	Shopping	AV 28	Restaurants
AV 12	Domestic travel	AV 29	Visit friends at their homes
Total non-market=core+shopping+		AV 30	Listen to radio
AV 8	Odd jobs	AV 31	Watch television or video
AV 9	Gardening	AV 32	Listen to records, tapes, cds
Childcare		AV 33	Study, homework
AV 11	Childcare	AV 34	Read books
Leisure		AV 35	Read papers, magazines
AV 4	School, classes	AV 36	Relax
AV 13	Dress/personal care	AV 37	Conversation
AV 14	Consume personal services	AV 38	Entertain friends at home
AV 15	Meals and snacks at home	AV 39	Knit, sew
AV 16	Sleep	AV 40	Other leisure
AV 17	Free time travel	AV 41	Unclassified time
AV 18	Excursions		

Hurst (2007) as closely as possible. We separate market work into “core” and “total” categories. Core market work includes work for pay at a primary job with paid meals and breaks included, work for pay at a second job, and work for pay at home.¹³ The total market hours are the sum of the core market hours and the commuting time.

Following Aguiar and Hurst (2007), we define two measures for home work: core home work and total home work.¹⁴ Core home work includes cooking, doing dishes, cleaning, laundry, and mending. In addition to core home work, total home work includes purchasing goods and services, running errands (e.g. going to the post office, picking up the dry cleaning, etc.), gardening, and “odd jobs” (e.g. home and vehicle repair and pet care). We also create a separate category for

¹³ Time spent on the job search is included in the work-from-home category in the MTUS. The entire work-from-home category represents a negligible share of the core market work.

¹⁴ The patterns for home work reported in the next section also hold for the measure of “core home work+shopping hours” and the measure of “total home work+child care.”

child care. Child care includes the time spent on the care of children and infants and the time spent on obtaining their medical care.¹⁵

Based on the measures for market work and home work, we also define two categories of total work, which is defined as the sum of market work and home work. Core total work is the sum of core market work and core home work. Total work is the sum of total market work and total home work. The residual of total work is considered leisure. Aguiar and Hurst (2007) analyze the trend in leisure for the United States, and Gimenez-Nadal and Sevilla (2012) analyze the trend in leisure for a few industrialized countries; thus, we do not analyze the trend in leisure in this paper.

3 Time allocation

This section discusses the constructed data. The estimates are reported as hours per week spent on each time allocation category. We report the estimates by decade.¹⁶ For most countries, there is only one survey (if any) in a given decade. When there is more than one survey in a decade (e.g. for the Netherlands, 1980 and 1985), the estimates are reported as the average of the surveys in this decade. We also report the changes in weekly hours between the 2000s and the 1960s and the 1970s. The time series patterns and the cross-sectional patterns are similar for the “core” and “total” measures of time allocation. For this reason, we only report and discuss the estimates for core market work, core home work, and core total work. The estimates for the “total” measures of time allocation are available in the web Appendix G.¹⁷

3.1 Market hours

3.1.1 Market hours per person

The cross-country differences in market hours per person have been well documented using the aggregate data from the GGDC.¹⁸ Table 3 reports our constructed

¹⁵ The time spent preparing meals for children and taking care of their clothing is included in core home work.

¹⁶ The latest year that the survey is available for France is 1998, the results for which are reported under the “2000s” category in the tables.

¹⁷ The web Appendix G also reports the measure of “total work+child care.” The pattern for this measure is similar to the pattern for core total work.

¹⁸ See, for example, Ohanian, Raffo and Rogerson (2008).

Table 3: Core market work.

	Average hours per week					Change 2000s	
	1960s	1970s	1980s	1990s	2000s	1960s	1970s
All							
France	29.2	24.6			22.9	-6.3	-1.7
Germany	31.4			25.9	19.7	-11.7	
Italy		23.9	22.9		22.0		-1.9
Netherlands		17.8	15.5	17.2	23.9		6.1
Norway		24.2	24.9	23.7	25.1		0.9
UK		24.9	22.5	25.5	24.8		-0.1
USA	28.6	26.5	26.4	27.9	27.2	-1.4	0.8
Men							
France	40.9	34.5			28.3	-12.6	-6.2
Germany	44.4			34.1	25.6	-18.8	
Italy		34.7	32.2		30.4		-4.3
Netherlands		27.0	24.3	25.4	31.4		4.4
Norway		35.8	32.2	30.2	30.7		-5.1
UK		36.8	29.5	32.0	30.6		-6.2
USA	41.8	36.6	33.1	33.4	32.5	-9.3	-4.1
Women							
France	17.6	14.9			17.6	0.0	2.7
Germany	18.7			17.5	13.7	-5.0	
Italy		13.5	13.8		13.6		0.1
Netherlands		8.5	6.9	8.8	16.3		7.8
Norway		12.3	17.6	17.1	19.3		7.0
UK		13.2	15.5	19.2	18.9		5.7
USA	16.3	17.0	20.1	22.4	22.0	5.7	5.0

Columns under “Change 2000s” report the change in weekly hours over the period 1960s or 1970s–2000s.

data for core market hours per person. The observations from the table are broadly consistent with the observations from the aggregate data. Specifically, the market hours in France and Germany were larger than those in the US in the 1960s and have decreased sharply ever since. By contrast, the weekly market hours per person in the US have not changed much. Because of the difference in the trend movement, in the 2000s, the market hours per person in European countries were lower than those in the US.

The cross-country differences in market hours are smaller in our data compared to those constructed from the GGDC data. The GGDC estimates are adjusted for paid vacations, holidays, and sick time, whereas the time use data are not adjusted. Because Europeans enjoy more paid time off, estimates from the time use data necessarily underestimate the differences in market hours between the

US and European countries. In the web Appendix C, we provide comparisons between our estimates and the estimates from the GGDC data.

3.1.2 Market hours by gender

Table 3 also reports the weekly market hours by gender. Consistent with the studies for the US by McGrattan and Rogerson (2004), Ramey and Francis (2009), and Aguiar and Hurst (2007) and studies for other countries by Gimenez-Nadal and Sevilla (2012), the market hours per male have declined and the market hours per female have increased in most countries, with the exceptions of male hours in the Netherlands and female hours in Germany.

In the 1960s, both men and women in France and Germany worked no less than their counterparts in the US. By contrast, in the 2000s, both men and women worked more in the US than in European countries. More importantly, the cross-country differences in market hours are smaller for men than for women. Specifically, the cross-country dispersion in market hours, as measured by the coefficient of variation,¹⁹ is larger for women than for men in every decade. The average over the five decades is 0.09 for men and is 0.2 for women.²⁰ The larger cross-country difference in market hours per female implies that female market hours contribute more to the cross-country variations in market hours per person.

3.1.3 Market hours by age

Next, we study market hours across age groups. Table 4 reports the trend change in market hours by age group. Core market hours have declined for both the young and the old groups in all countries except the Netherlands. Men of all ages have generally decreased their market hours. Prime-age women have increased their market hours in all countries. Young and old women have increased their market hours in some countries but have decreased their market hours in others.

Table 5 reports the levels of market hours by age group. Prime-age men in every country work the highest number of hours in all five decades. Prime-age

¹⁹ The coefficient of variation is defined as the standard deviation normalized by the mean.

²⁰ The coefficient of variation for core market hours by decade from the 1960s to the 2000s, respectively, is 0.04, 0.11, 0.11, 0.10, and 0.07 for men and 0.06, 0.22, 0.30, 0.27, and 0.17 for women.

Table 4: Change in core market work by age.

	Change 1960s–2000s				Change 1970s–2000s			
	15–24	25–54	55–64	Total	15–24	25–54	55–64	Total
All								
France	–12.9	–3.6	–15.0	–6.3	–9.1	1.3	–10.8	–1.7
Germany	–23.8	–7.7	–13.2	–11.7				
Italy					–9.5	–0.1	–3.6	–1.9
Netherlands					–0.0	9.0	2.5	6.1
Norway					–4.6	2.6	–2.4	0.9
UK					–3.1	1.2	–4.3	–0.1
USA	–6.6	0.3	–5.1	–1.4	–4.0	1.1	0.6	0.8
Men								
France	–15.0	–11.8	–22.6	–12.6	–11.3	–4.9	–15.3	–6.2
Germany	–25.7	–16.0	–24.3	–18.8				
Italy					–11.0	–3.3	–8.3	–4.3
Netherlands					–0.4	5.5	1.3	4.4
Norway					–6.4	–4.9	–9.5	–5.1
UK					–7.4	–5.6	–11.7	–6.2
USA	–14.4	–7.5	–15.3	–9.3	–8.8	–4.5	–3.8	–4.1
Women								
France	–10.7	4.9	–7.8	0.0	–6.8	7.7	–6.9	2.7
Germany	–21.9	–0.0	–4.2	–5.0				
Italy					–7.4	2.3	–0.2	0.1
Netherlands					0.4	12.7	2.8	7.8
Norway					–2.4	10.5	4.3	7.0
UK					0.8	8.0	2.0	5.7
USA	0.9	7.6	3.0	5.7	0.5	6.2	3.8	5.0

Values are changes in average hours per week.

women work the highest number of hours in the 2000s relative to young and older women in the same period but fewer hours than young women in European countries in earlier periods. More importantly, in every decade, market hours are more similar across countries for the prime-age group than for the young and old groups. In particular, in the 2000s, the cross-country difference in market hours is much larger for the old group than for the prime-age group. Specifically, the average of market hours for old Europeans is 40% (9 hours) less than the US value, and the average of market hours for prime-age Europeans is only 12% (3.6 hours) less than the US value. The cross-country variation is also larger for the old group. Old Europeans work as much as 45%–89% of their American counterparts, and prime-age Europeans work as much as 79%–94% of their American counterparts.

Table 5: Core market work by age.

	1960s					1970s					2000s				
	15-24	25-54	55-64	Total	Total	15-24	25-54	55-64	Total	Total	15-24	25-54	55-64	Total	Total
All															
France	23.8	32.7	25.2	29.2	20.0	27.8	21.1	24.6	10.9	29.1	10.2	22.9			
Germany	36.1	32.2	23.3	31.4	20.1	27.8	15.6	23.9	12.4	24.5	10.1	19.7			
Italy					19.8	18.7	10.6	17.8	10.6	27.6	12.0	22.0			
Netherlands					22.9	25.3	22.5	24.2	19.7	27.7	13.0	23.9			
Norway					22.1	27.1	21.2	24.9	18.3	27.9	20.1	25.1			
UK					21.1	30.0	22.1	26.5	18.9	28.3	17.0	24.8			
USA	23.7	30.8	27.8	28.6	21.1	30.0	22.1	26.5	17.1	31.1	22.7	27.2			
Men															
France	27.6	47.8	36.4	40.9	23.9	40.9	29.0	34.5	12.6	36.0	13.8	28.3			
Germany	39.7	48.0	38.2	44.4	24.3	41.2	27.1	34.7	14.0	32.0	13.9	25.6			
Italy					22.2	31.1	18.8	27.0	13.3	37.8	18.8	30.4			
Netherlands					29.1	39.1	34.1	35.8	21.9	36.6	20.1	31.4			
Norway					28.9	40.6	34.9	36.8	22.7	34.1	24.6	30.7			
UK					27.7	42.2	31.1	36.6	21.5	34.9	23.2	30.6			
USA	33.2	45.2	42.5	41.8	27.7	42.2	31.1	36.6	18.9	37.6	27.3	32.5			
Women															
France	20.0	17.6	14.8	17.6	16.0	14.8	13.8	14.9	9.2	22.5	6.9	17.6			
Germany	32.6	16.8	10.6	18.7	15.4	14.9	5.7	13.5	10.6	16.8	6.3	13.7			
Italy					17.1	5.8	3.1	8.5	8.0	17.2	5.5	13.6			
Netherlands					16.3	11.0	11.4	12.3	17.6	18.5	5.9	16.3			
Norway					15.6	13.7	8.7	13.2	13.9	21.5	15.6	19.3			
UK					14.8	18.6	14.6	17.0	16.4	21.7	10.8	18.9			
USA	14.4	17.2	15.5	16.3	14.8	18.6	14.6	17.0	15.3	24.8	18.4	22.0			

Average weekly hours by age group.

3.2 Home hours

3.2.1 Home hours per person

This section examines the estimated home hours per person. Table 6 reports the estimates for core home hours per person. We start the analysis with the observation that core home hours per person have declined in all countries over this period of time. Core home hours in the United States decreased by 5.2 hours between the 1960s and the 2000s and by 3.6 hours between the 1970s and the 2000s.²¹ The average decline in core home hours in European countries is 4 hours

Table 6: Core home work.

	Average hours per week					Change 2000s	
	1960s	1970s	1980s	1990s	2000s	1960s	1970s
All							
France	15.3	15.3			11.3	-4.0	-4.0
Germany	14.3			9.8	10.4	-3.9	
Italy		15.6	15.9		14.1		-1.5
Netherlands		11.5	11.5	10.1	8.9		-2.6
Norway		16.6	12.3	9.6	11.5		-5.1
UK		12.1	11.9	10.7	10.1		-2.0
USA	13.5	11.9	9.8	8.4	8.3	-5.2	-3.6
Men							
France	3.5	4.3			4.1	0.6	-0.2
Germany	1.4			4.0	5.1	3.7	
Italy		2.2	1.9		3.2		1.0
Netherlands		2.9	3.9	4.3	4.5		1.6
Norway		3.9	4.8	4.3	7.4		3.5
UK		2.4	5.0	4.9	5.5		3.1
USA	2.7	3.0	4.4	4.7	4.6	1.9	1.6
Women							
France	27.0	26.2			18.3	-8.7	-7.9
Germany	26.3			15.7	15.8	-10.5	
Italy		28.7	29.5		25.1		-3.6
Netherlands		20.2	19.2	16.0	13.3		-6.8
Norway		29.5	20.0	15.1	15.7		-13.8
UK		21.7	18.8	16.3	14.7		-7.0
USA	23.7	20.2	15.0	12.0	12.1	-11.6	-8.1

Columns under “Change 2000s” report the change in weekly hours over the period 1960s or 1970s–2000s.

²¹ Ramey and Francis (2009) and Aguiar and Hurst (2007) also find a decrease in home hours for the US.

from the 1960s and is 3 hours from the 1970s. In particular, the decline from the 1970s onward is larger in Norway and France than in the United States.

Next, we discuss the cross-country difference in the levels of core home hours. In every decade, Americans spend less time in core home activities than do Europeans.²² In the 2000s, core home hours are 70% (5.8 hours) higher in Italy, 22% (1.8 hours) higher in Germany and the UK, 7% (0.6 hour) higher in the Netherlands, and 35% (3 hours) higher in other countries. Our findings are consistent with the studies by Freeman et al. (2005), Ragan (2013), and Ngai and Pissarides (2011). The former study finds that home hours are higher in Germany than in the US in the early 1990s. The latter two find that home hours are greater in European countries than in the US in the 2000s.

3.2.2 Home hours by gender

Table 6 also reports core home hours by gender. The table reveals that women in all countries reduced their core home hours and that men in all countries increased their core home hours.²³ Hence, the decline in home hours per person is entirely driven by the decline in female home hours in all countries. Because of the opposite trend movement, the gap between male and female home hours has narrowed from an average of 23 hours in the 1960s to an average of 11 hours in the 2000s, with women working more at home in all countries and all years.

More importantly, we find that the countries with a larger decline in core home hours generally display a larger decline in core home hours per female. Specifically, in the countries with a more-than-3-hour decline in core home hours per person between the 1970s and the 2000s (France, Norway, and the US), the average decline in female home hours is 10 hours compared to the average decline in female home hours of 5.8 hours in the other countries. This observation suggests that the cross-country difference in the trend of home hours per female contributes more to the cross-country difference in the trend of home hours per person.

We next explore the level differences in home hours across countries. Table 6 reveals that core home hours per male in the US generally lie in the middle of all of the countries studied and that core home hours per female in the US are always the lowest in every decade. With respect to the magnitude in the 2000s, men in Italy,

²² The Netherlands in 1970 is an exception.

²³ Aguiar and Hurst (2007) and Ramey and Francis (2009) find the same pattern for the US and Gimenez-Nadal and Sevilla (2012) find the same pattern for several European countries.

France, and the Netherlands work less at home than do men in the US, and men in other European countries all work more at home than men do in the US. Core home hours per male range from 70% of the US level (1.4 hours less) in Italy to 161% (2.8 hours more) of the US level in Norway, and the European average is 8% (0.4 hours) greater than the US level. The cross-country difference in core home hours per female is more pronounced. Core home hours per female range from 110% of the US level (2 hours more) in the Netherlands to 207% (13 hours more) of the US level in Italy, and the European average is 42% (5.1 hours) greater than the US level. This finding demonstrates that the difference in home hours per female also contributes more to the difference in home hours per person in the 2000s.

3.2.3 Home hours by age

Table 7 reports the changes in core home hours by age group. Core home hours have declined across all age groups in all countries. Men of all age groups have increased their core home hours except in France. The largest and the smallest increases are generally obtained for old men and young men, respectively. By contrast, in every country, women of all age groups have decreased their core home hours. The largest decrease is generally obtained for prime-age women. The increasing trend for men and the decreasing trend for women of all age groups imply that the female series also drives the aggregate decline in home hours for each age group.

Table 8 reports the average number of home hours per week by age group. Across countries, decades, and genders, young individuals spend less time and old individuals spend more time in home production than prime-age individuals. In addition, in the 2000s, the differences in home hours between the US and European countries are larger for the old age group than for the other age groups. Specifically, average Europeans aged 15–24 work 6% (0.3 hours) more at home, average Europeans aged 25–54 work 28% (2.6 hours) more at home, and average Europeans aged 55–64 work 54% (5.2 hours) more at home than the corresponding age groups in the US.

In summary, this section establishes the common decreasing trend in home hours per person for the countries studied. We demonstrate that the cross-country differences in female market hours and home hours contribute more to the differences in both the trends and the levels of time allocation per person.²⁴ We also

²⁴ Freeman et al. (2005) find that there is more variation in the cross-country female time allocation using data on the 1990s.

Table 7: Change in core home work by age.

	Change 1960s–2000s				Change 1970s–2000s			
	15–24	25–54	55–64	Total	15–24	25–54	55–64	Total
All								
France	–6.8	–3.6	–2.8	–4.0	–6.1	–4.1	–2.3	–4.0
Germany	–3.1	–4.8	–3.9	–3.9				
Italy					–1.4	–2.9	–2.5	–1.5
Netherlands					–2.7	–3.6	–2.4	–2.6
Norway					–2.0	–7.2	–4.0	–5.1
UK					–1.4	–2.9	–1.7	–2.0
USA	–5.0	–5.4	–6.1	–5.2	–4.9	–3.4	–4.0	–3.6
Men								
France	–0.6	1.2	–0.3	0.6	–0.7	0.1	–1.3	–0.2
Germany	1.5	3.7	5.0	3.7				
Italy					0.2	0.9	1.9	1.0
Netherlands					0.7	1.5	2.0	1.6
Norway					1.8	3.4	5.0	3.5
UK					1.3	3.1	4.2	3.1
USA	0.2	2.3	1.5	1.9	–0.5	2.3	0.6	1.6
Women								
France	–13.5	–8.6	–4.2	–8.7	–12.1	–8.5	–2.8	–7.9
Germany	–8.1	–12.1	–10.1	–10.5				
Italy					–3.1	–6.2	–5.4	–3.6
Netherlands					–6.3	–9.0	–5.8	–6.8
Norway					–6.0	–18.0	–12.2	–13.8
UK					–3.9	–9.0	–6.8	–7.0
USA	–10.2	–12.6	–11.7	–11.6	–9.0	–8.6	–8.0	–8.1

Values are changes in average hours per week.

find that the differences in time allocation are more pronounced for the old-age group than for the prime-age group between the US and European countries.

3.3 Child care

Table 9 reports the average hours per week spent on child care-related activities. Both men and women have increased their time spent on child care in almost all countries over the sample period. In addition, as shown in Table 10, most of the increase in child care time for both genders can be attributed to the increase in child care time by prime-age individuals. Indeed, young men and young women have both decreased their child care time in most of the countries studied. This

Table 8: Core home work by age.

	1960s					1970s					2000s				
	15-24	25-54	55-64	Total	Total	15-24	25-54	55-64	Total	Total	15-24	25-54	55-64	Total	Total
All															
France	12.2	15.8	18.1	15.3		11.5	16.3	17.6	15.3		5.4	12.2	15.3	11.3	
Germany	7.0	16.0	17.4	14.3							3.9	11.1	13.5	10.4	
Italy						6.0	17.9	22.7	15.6		4.6	14.9	20.2	14.1	
Netherlands						6.3	13.2	14.1	11.5		3.6	9.6	11.7	8.9	
Norway						7.9	19.2	19.3	16.6		5.9	12.0	15.3	11.5	
UK						6.7	13.6	14.4	12.1		5.3	10.7	12.7	10.1	
USA	9.5	14.7	15.6	13.5		9.4	12.6	13.6	11.9		4.5	9.2	9.6	8.3	
Men															
France	3.0	3.2	5.5	3.5		3.1	4.2	6.5	4.3		2.4	4.3	5.2	4.1	
Germany	0.9	1.3	2.4	1.4							2.5	5.1	7.4	5.1	
Italy						1.1	2.2	3.7	2.2		1.3	3.1	5.6	3.2	
Netherlands						1.5	3.4	3.9	2.9		2.2	4.9	5.9	4.5	
Norway						2.1	4.3	5.2	3.9		3.9	7.7	10.2	7.4	
UK						1.7	2.5	2.9	2.4		3.0	5.6	7.1	5.5	
USA	2.2	2.6	3.9	2.7		2.9	2.7	4.8	3.0		2.4	5.0	5.3	4.6	
Women															
France	21.7	28.5	29.0	27.0		20.3	28.4	27.7	26.2		8.2	19.9	24.9	18.3	
Germany	13.4	29.4	29.8	26.3							5.3	17.3	19.6	15.8	
Italy						11.2	33.1	39.4	28.7		8.1	26.9	34.0	25.1	
Netherlands						11.3	23.5	23.3	20.2		5.0	14.5	17.5	13.3	
Norway						14.0	34.5	32.8	29.5		8.0	16.6	20.6	15.7	
UK						11.5	24.6	24.9	21.7		7.5	15.6	18.2	14.7	
USA	16.8	25.9	25.1	23.7		15.7	21.9	21.5	20.2		6.7	13.3	13.4	12.1	

Average weekly hours by age group.

Table 9: Childcare.

	Average hours per week					Change 2000s	
	1960s	1970s	1980s	1990s	2000s	1960s	1970s
All							
France	5.4	4.0			2.7	−2.7	−1.3
Germany	3.3			3.4	3.2	−0.1	
Italy		2.2	2.1		2.5		0.3
Netherlands		2.6	2.8	2.9	3.0		0.4
Norway		2.9	3.2	3.8	3.8		0.9
UK		1.6	2.5	4.0	3.8		2.1
USA	3.1	3.0	2.3	2.1	4.6	1.5	1.6
Men							
France	1.9	1.3			1.3	−0.6	0.0
Germany	1.0			2.0	1.9	0.9	
Italy		1.2	1.1		1.3		0.1
Netherlands		1.4	1.4	1.6	1.8		0.4
Norway		1.2	1.9	2.2	2.1		0.9
UK		0.5	1.4	2.4	2.2		1.8
USA	1.2	1.2	0.9	0.9	2.8	1.6	1.6
Women							
France	8.8	6.7			4.1	−4.7	−2.6
Germany	5.4			4.9	4.6	−0.8	
Italy		3.2	3.1		3.6		0.4
Netherlands		3.7	4.0	4.3	4.3		0.6
Norway		4.7	4.5	5.4	5.5		0.8
UK		2.6	3.8	5.7	5.2		2.6
USA	5.0	4.7	3.7	3.2	6.4	1.4	1.7

Columns under “Change 2000s” report the change in weekly hours over the period 1960s or 1970s–2000s.

finding is consistent with the pattern of delayed childbearing in the past 50 years. Not surprisingly, Table 11 shows that women and prime-age individuals spend more time on child care in every country and every decade.

3.4 Total work

Table 12 reports the weekly hours of core total work. Core total hours have declined except in the Netherlands. In general, the increase in male home hours does not fully compensate for the decline in male market hours, and the increase in female market hours does not fully compensate for the decline in female home hours. As a result, both male and female total work hours have declined. This

Table 10: Change in childcare by age.

	Change 1960s–2000s				Change 1970s–2000s			
	15–24	25–54	55–64	Total	15–24	25–54	55–64	Total
All								
France	–5.1	–2.7	–0.4	–2.7	–4.7	–0.7	0.3	–1.3
Germany	–2.1	0.5	–0.4	–0.1				
Italy					–0.8	0.6	–0.4	0.3
Netherlands					–0.8	0.5	1.2	0.4
Norway					–0.6	1.3	–0.4	0.9
UK					1.1	2.7	0.7	2.1
USA	0.2	2.2	–0.6	1.5	–0.3	2.6	–0.5	1.6
Men								
France	–2.0	–0.4	0.2	–0.6	–0.9	0.1	–0.1	0.0
Germany	–0.7	1.7	–0.2	0.9				
Italy					–0.1	0.1	–0.1	0.1
Netherlands					–0.3	0.3	0.3	0.4
Norway					–0.3	1.3	–0.2	0.9
UK					1.0	2.2	0.5	1.8
USA	0.3	2.2	–0.0	1.6	0.1	2.3	–0.2	1.6
Women								
France	–8.2	–5.0	–0.9	–4.7	–8.6	–1.6	0.7	–2.6
Germany	–3.7	–0.3	–0.6	–0.8				
Italy					–1.7	1.1	–0.6	0.4
Netherlands					–1.4	0.5	2.1	0.6
Norway					–0.9	1.1	–0.6	0.8
UK					1.4	3.2	1.0	2.6
USA	0.2	2.1	–1.3	1.4	–0.7	3.0	–0.8	1.7

Values are changes in average hours per week.

finding suggests that, although both men and women reallocate their time from the market to the home and vice versa, they are also allocating more time to other activities, mainly leisure. Despite the large difference in market hours and home hours between the two genders, men and women have a similar number of total hours for most of the available surveys, which is consistent with the finding by Burda, Hamermesh, and Weil (2008) for the 2000s.

The changes in market hours and home hours provide insights into the sources of the change in total work. In Germany and Italy, the decline in total work is largely driven by the decline in market work; in France, although the decline in total work relative to the 1960s is roughly divided in half, the decline relative to the 1970s is largely driven by the decline in home work; in the United States, Norway, and the United Kingdom, the decline in total work is primarily

Table 11: Childcare by age.

	1960s					1970s					2000s				
	15–24	25–54	55–64	Total		15–24	25–54	55–64	Total		15–24	25–54	55–64	Total	
All															
France	6.0	6.2	1.7	5.4		5.6	4.2	0.9	4.0		0.9	3.5	1.3	2.7	
Germany	2.6	4.3	0.7	3.3							0.4	4.8	0.3	3.2	
Italy						1.5	3.0	0.5	2.2		0.6	3.6	0.1	2.5	
Netherlands						1.7	3.5	0.4	2.6		0.9	4.0	1.6	3.0	
Norway						2.1	4.0	0.5	2.9		1.5	5.2	0.2	3.8	
UK						1.5	2.1	0.3	1.6		2.6	4.8	1.0	3.8	
USA	2.6	3.8	1.3	3.1		3.1	3.4	1.2	3.0		2.8	6.0	0.6	4.6	
Men															
France	2.3	2.1	0.4	1.9		1.1	1.6	0.6	1.3		0.3	1.8	0.6	1.3	
Germany	0.8	1.2	0.5	1.0							0.1	2.9	0.3	1.9	
Italy						0.3	1.9	0.3	1.2		0.2	1.9	0.1	1.3	
Netherlands						0.5	2.1	0.3	1.4		0.3	2.5	0.7	1.8	
Norway						0.5	1.7	0.3	1.2		0.2	3.1	0.2	2.1	
UK						0.3	0.8	0.1	0.5		1.2	3.0	0.6	2.2	
USA	0.5	1.6	0.5	1.2		0.6	1.6	0.7	1.2		0.8	3.8	0.5	2.8	
Women															
France	9.8	10.2	2.8	8.8		10.2	6.9	1.2	6.7		1.6	5.3	1.9	4.1	
Germany	4.5	7.2	0.9	5.4							0.8	6.9	0.3	4.6	
Italy						2.8	4.1	0.7	3.2		1.1	5.2	0.1	3.6	
Netherlands						2.8	5.0	0.4	3.7		1.5	5.6	2.6	4.3	
Norway						3.8	6.3	0.8	4.7		2.9	7.4	0.2	5.5	
UK						2.6	3.3	0.4	2.6		3.9	6.5	1.3	5.2	
USA	4.6	6.0	2.0	5.0		5.5	5.1	1.5	4.7		4.8	8.1	0.7	6.4	

Average weekly hours by age group.

Table 12: Core total work.

	Average hours per week					Change 2000s	
	1960s	1970s	1980s	1990s	2000s	1960s	1970s
All							
France	44.5	39.9			34.2	-10.3	-5.7
Germany	45.7			35.7	30.1	-15.6	
Italy		39.5	38.8		36.2		-3.3
Netherlands		29.3	27.1	27.3	32.8		3.5
Norway		40.8	37.2	33.4	36.6		-4.2
UK		37.0	34.4	36.2	34.8		-2.2
USA	42.2	38.3	36.2	36.3	35.5	-6.7	-2.8
Men							
France	44.4	38.8			32.4	-12.0	-6.4
Germany	45.9			38.0	30.7	-15.2	
Italy		36.8	34.1		33.7		-3.1
Netherlands		29.9	28.1	29.7	35.9		6.0
Norway		39.7	37.0	34.5	38.2		-1.5
UK		39.2	34.5	36.9	36.0		-3.2
USA	44.6	39.7	37.5	38.1	37.0	-7.6	-2.7
Women							
France	44.6	41.1			36.0	-8.6	-5.1
Germany	45.0			33.2	29.5	-15.5	
Italy		42.2	43.3		38.7		-3.5
Netherlands		28.7	26.1	24.9	29.6		0.9
Norway		41.8	37.6	32.2	35.0		-6.8
UK		34.9	34.3	35.6	33.6		-1.3
USA	40.0	37.2	35.1	34.4	34.1	-5.9	-3.1

Columns under “Change 2000s” report the change in weekly hours over the period 1960s or 1970s–2000s.

driven by the decline in home work; and in the Netherlands, the increase in total work is driven by the increase in market work, whereas a decline in home work is observed.

Table 13 reports the change in core total work by age group. Core total work has declined for all age groups for both genders.²⁵ Prime-age individuals of both genders have the smallest decline in all countries, and young individuals have the largest decline in most countries. Table 14 reports the levels of core total work by age group. Prime-age men and women work the most, and young men and

²⁵ The Netherlands is an exception.

Table 13: Change in core total work by age.

	Change 1960s–2000s				Change 1970s–2000s			
	15–24	25–54	55–64	Total	15–24	25–54	55–64	Total
All								
France	–19.8	–7.1	–17.7	–10.3	–15.3	–2.8	–13.1	–5.7
Germany	–26.9	–12.5	–17.0	–15.6				
Italy					–10.8	–3.1	–6.1	–3.3
Netherlands					–2.7	5.4	0.1	3.5
Norway					–6.5	–4.6	–6.4	–4.2
UK					–4.6	–1.8	–6.0	–2.2
USA	–11.6	–5.1	–11.1	–6.7	–8.9	–2.3	–3.5	–2.8
Men								
France	–15.6	–10.6	–23.0	–12.0	–11.9	–4.8	–16.7	–6.4
Germany	–24.2	–12.3	–19.2	–15.2				
Italy					–10.8	–2.4	–6.5	–3.1
Netherlands					0.4	7.0	3.3	6.0
Norway					–4.6	–1.6	–4.5	–1.5
UK					–6.2	–2.6	–7.5	–3.2
USA	–14.2	–5.2	–13.8	–7.6	–9.3	–2.3	–3.2	–2.7
Women								
France	–24.2	–3.7	–11.9	–8.6	–18.9	–0.8	–9.6	–5.1
Germany	–29.9	–12.2	–14.3	–15.5				
Italy					–10.6	–3.9	–5.5	–3.5
Netherlands					–5.9	3.7	–3.0	0.9
Norway					–8.5	–7.6	–8.0	–6.8
UK					–3.2	–1.1	–4.7	–1.3
USA	–9.4	–5.0	–8.8	–5.9	–8.5	–2.4	–4.2	–3.1

Values are changes in average hours per week.

women work the least in all countries and all decades. There is also less cross-country variation in total work for the prime-age group than there is for the other age groups. In particular, in the 2000s, core total work in European countries ranges from 88% to 105% of the US level for the prime-age group, and the corresponding range is 71%–112% for the young group and 74%–110% for the old group.

3.5 Discussion

This section compares our estimates and the estimates constructed with the constant demographic weighting scheme. Following Aguiar and Hurst (2007) and

Table 14: Core total work by age.

	1960s					1970s					2000s				
	15-24	25-54	55-64	Total		15-24	25-54	55-64	Total		15-24	25-54	55-64	Total	
All															
France	36.0	48.4	43.3	44.5		31.5	44.1	38.7	39.9		16.2	41.3	25.6	34.2	
Germany	43.1	48.1	40.7	45.7							16.3	35.6	23.7	30.1	
Italy						26.1	45.6	38.3	39.5		15.3	42.5	32.2	36.2	
Netherlands						26.0	32.0	24.6	29.3		23.2	37.3	24.7	32.8	
Norway						30.7	44.5	41.8	40.8		24.2	40.0	35.4	36.6	
UK						28.8	40.8	35.7	37.0		24.2	39.0	29.7	34.8	
USA	33.2	45.4	43.4	42.2		30.5	42.6	35.8	38.3		21.6	40.4	32.2	35.5	
Men															
France	30.6	50.9	41.9	44.4		26.9	45.1	35.6	38.8		15.0	40.3	18.9	32.4	
Germany	40.7	49.4	40.5	45.9							16.5	37.1	21.4	30.7	
Italy						25.4	43.4	30.8	36.8		14.6	40.9	24.3	33.7	
Netherlands						23.7	34.5	22.7	29.9		24.0	41.5	26.0	35.9	
Norway						31.1	43.4	39.3	39.7		26.6	41.8	34.8	38.2	
UK						30.6	43.1	37.8	39.2		24.5	40.6	30.4	36.0	
USA	35.4	47.8	46.4	44.6		30.5	44.9	35.8	39.7		21.3	42.6	32.6	37.0	
Women															
France	41.7	46.1	43.8	44.6		36.3	43.2	41.5	41.1		17.5	42.3	31.9	36.0	
Germany	45.9	46.2	40.3	45.0							15.9	34.1	26.0	29.5	
Italy						26.6	48.0	45.1	42.2		16.0	44.1	39.5	38.7	
Netherlands						28.4	29.4	26.4	28.7		22.5	33.0	23.4	29.6	
Norway						30.3	45.6	44.2	41.8		21.8	38.1	36.2	35.0	
UK						27.0	38.4	33.7	34.9		23.9	37.3	29.0	33.6	
USA	31.3	43.1	40.7	40.0		30.4	40.5	36.0	37.2		21.9	38.1	31.9	34.1	

Average weekly hours by age group.

Jimenez-Nadal and Sevilla (2012), we construct measures of time allocation with the constant demographic weighting scheme. As discussed above, the estimates based on the constant demographic weighting scheme do not allow for a meaningful cross-country comparison of time allocation levels. Hence, this section focuses on the comparison of the trend changes in time allocation from the two weighting schemes.

The constant demographic weighted estimates exhibit similar trend movements as the reported estimates in market hours, home hours, and child care hours by gender.²⁶ Specifically, the estimates deliver an increase in female market hours, male home hours, and child care hours of both genders and also deliver a decrease in female home hours and male market hours. More importantly, the decrease in female home hours is also larger than the increase in male home hours under the constant demographic weighting scheme. Hence, the estimates also reaffirm the declining trend in home hours per person and the importance of female home hours in driving the declining trend in home hours per person. A detailed comparison of our estimates with the constant demographic weighted estimates is available in the web Appendix A.

4 Conclusion

This paper constructed market hours, home hours, and total hours for the US and several European countries. Three findings emerge from the data. First, home hours have declined in both the US and European countries over the past 50 years. Second, female time allocation contributes more to the cross-country difference than does male time allocation. Third, the time allocation of non-prime-age individuals is more different across countries than is the time allocation of prime-age individuals.

Men have decreased their market hours and increased their home hours, and women have increased their market hours and decreased their home hours. The changes lead to the reduction in the gaps of both market hours and home hours between men and women. Most of the decrease in female home hours is shifted to market hours. The increase in female market hours is mainly due to the increase in the female labor force participation rate. As discussed in Section 1.1,

²⁶ The market hours for women in France and Italy and for men in the Netherlands display trends with the opposite sign when estimated using constant demographic weights.

the improvement in home production productivity and changes in cultural and social norms have been identified as potential causes of the increase in the female labor force participation rate. The increase in male home hours is likely because women devote less time to home work and thus men must take on more responsibilities at home. It may be also related to changes in attitudes toward men's performing more housework.

The existing models that study the difference in time allocation between the US and Europe mainly focus on time allocation per person and market hours by sector.²⁷ This paper suggests that it is also of interest to include gender and/or age in the model and then use the model to explore the factors that can account for the cross-country difference in time allocation by demographic groups. One interesting question to ask is whether institutional differences, such as differences in tax systems, labor laws or social welfare programs, can account for the cross-country differences in time allocation by demographic groups. For instance, higher tax rates in European countries may be more harmful to the market labor supply of women because women are less attached to the labor market than men.

The cross-country difference in time allocation by age is mainly driven by the difference in the employment to population ratio by age. The employment to population ratio is much lower for the young and old groups in European countries than it is in the US. This phenomenon may be related to the more generous welfare programs and/or the more rigid labor market regulations in Europe. For instance, more generous retirement benefits may contribute to the low employment to population ratio of old Europeans. The more generous unemployment insurance benefits and the more rigid labor market regulations may contribute to the low employment to population ratio of young Europeans. We leave these questions for future research.

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²⁷ See, for example, Ragan (2013), Rogerson (2008), Ngai and Pissarides (2008), Ngai and Pissarides (2011), and McDaniel (2011).

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