



Ageing Europe – An Application of  
National Transfer Accounts for Explaining  
and Projecting Trends in Public Finances

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## **Production and Transfers through Unpaid Work by Age and Gender: A Comparative Analysis of Austria, Italy and Slovenia**

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**Abstract**

Rapid population ageing shifts the relation between age of individuals and their economic activity into the focus of policy makers and scientists. National Transfer Accounts introduce age in the System of National Accounts: they measure for each age group the generation of income, its redistribution across age groups as well as age-specific use of disposable income for consumption and saving. In this paper we introduce also unpaid household work as well as differences in the reallocation of resources across age by gender. We estimate how much time each age group devotes to unpaid production activities and how time spent in these activities is distributed across age and gender. We provide measures of total labour (paid and unpaid work combined) for men and women during the life course. Finally, we define an indicator of the “rush hours of life” based on age spans in which individual’s working time exceeds their free time. Our aim is to gain insight into country-specific settings that may shape these distribution mechanisms and we therefore present comparative results for Austria, Italy and Slovenia. Our results show that the main receivers of time transfers are children in form of childcare. Paid and unpaid work combined are squeezing out free time and generating a “rush hour” of life for working age population. The rush hour is especially prevalent for women in Italy and Slovenia between age 30 and 49 when their provided housework and childcare more than compensate their lower involvement in paid work compared to men.

**Keywords** Intergenerational transfers · Household production · Time use · Gender · Economic life cycle

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## 1. Introduction

Increasing longevity and low fertility are causing rapid population aging in developed countries. The projected changes in the age structure of the population will affect total production and consumption and challenge the sustainability of social security systems. Demographic changes therefore shift the design of the economic life course (the age pattern of economic activities) and the corresponding transfer systems into the focus of scientists and policy makers. This interest in the relation between economic activity and age motivates the introduction of the age dimension into economic data. Recently age has been introduced into the System of National Accounts (SNA) by setting up age-specific National Accounts, so called National Transfer Accounts (NTA). NTA measure how much income each age group generates through the input of labour and capital, how income is redistributed across age groups through public and private transfers and how each age group uses the disposable resources for saving and consumption. NTA provide important tools and the data to measure, depict and analyse the role of age and transfers in the economy.

Resources are produced and consumed not only through market transactions captured in the SNA but also in the form of services originating from unpaid work. Most important activities of unpaid work include cooking, cleaning and care activities provided for people's own consumption and/or for the consumption of other (household) members. The inclusion of the value of unpaid work in the SNA, as an instrument to obtain better measures of actual production and consumption, has long been discussed (for example Stiglitz et al. 2009). So far, unpaid work has been considered only in the form of "household satellite accounts" and as such it is not visible in the core SNA. In most countries household satellite accounts are not developed on a regular basis, but at the initiative of individual researchers. See e.g. Landefeld et al. (2009) for the US or Ruger (2008) for Germany and Finland. However there are attempts to harmonize the methodology (e.g. Abraham and Mackie 2005) and there have been some publications comparing the level of unpaid household work across countries (e.g. OECD 2011).

Unpaid work has long been disregarded in the analysis of intergenerational redistribution leading to an undervaluation of women's contribution to the economy. The gender-specific age profiles of labour income and consumption in NTA show that there are large monetary flows from men to women, since both genders consume rather similarly but the former provide more market work as compared to the latter and thereby generate higher incomes (see Hammer (2014) for Austria and Zannella (2015) for Italy). This however is an incomplete picture and somewhat misleading, since from time use surveys we know that in terms of unpaid work the situation is just reversed, i.e. women spend much more time on household production than men (OECD 2011). Hence, regarding total work women may even contribute more time as men to production activities. Therefore, introducing the gender dimension to the NTA framework should not be done without also extending the analysis to unpaid work. To fully understand the production, consumption and reallocation of activities across age and gender we need to account for both types of activities, market (SNA) and non-market production.

In this paper we focus on unpaid work and analyse the non-SNA production activities by age and gender. We use the methodology from NTA to measure production, consumption and reallocation of time resulting from unpaid work. We will conduct our analysis for three different countries, Austria, Italy and Slovenia, using original micro data from national time use surveys (TUS). The choice of the countries is mainly motivated by the existence of substantial differences in their welfare arrangements, enabling us to study how far institutional settings may shape the age and the gender pattern of economic activities and resource reallocation. After giving an overview over the relevant literature we briefly present the method of National Transfer Accounts (NTA) and describe the data sources. We provide estimates of total labour, consisting of paid and unpaid work, by age and gender. Then, we focus on non-market production. Having the detailed TUS data available, we can provide insight into different components of unpaid work and the differences across the three countries. We estimate the gender-specific age profiles of consumption and transfers emerging from non-market work.

With our results from this “non-market transfer account” we will gain a more comprehensive picture about production and consumption activities during the life course as well as about flows of transfers among different ages. We thereby gain insight into how far market and non-market production/consumption are divided between gender at different ages in their life course. Finally, we analyse allocation of people’s time between productive and non-productive activities over the life cycle. In working age people are involved in paid work but they also provide unpaid work, especially in form of childcare when having little children. Women can therefore face double shifts – one shift in form of paid work and another one in form of unpaid work. Consequently, productive activities squeeze at specific life stages out people’s free time. We quantify the “rush hour of life” through the age span during which working time exceeds free time (leisure and personal care). The last section concludes.

## 2. Background literature

Esping-Andersen (1990) developed the concept of welfare *regimes* according to which welfare states can be classified in different typologies, namely regimes, depending on the ways in which the provision of welfare is allocated between state, market and households. He classified Austria and Italy as conservative welfare regimes. The conservative typology, greatly influenced by the historical legacy of Catholic social policies as well as corporatism, can be identified in familialism: a composite of the principle of subsidiarity, i.e. families are responsible for intergenerational obligations and public intervention has to be considered as marginal, and a strong orientation towards the male-breadwinner family model. The higher is the degree of familialism, the narrowest is the solidarity of the state in terms of benefits. Attempts to classify post-socialist welfare states are rather complex due to the great variety of institutional settings as well as their transitional nature. According to Saraceno and Keck (2011), Slovenia represents a mid-path between the Austrian *supported familialism*, i.e. families are encouraged to support themselves through the provision of a number of financial incentives, and the Italian *familialism by default*, i.e. a shift of intergenerational responsibilities to families with minimal or absent economic

support from the state. The classification and typology of welfare regimes has been discussed intensively (for an encompassing overview of the debate around Esping-Andersen ideal types as well as of typifying welfare states see Arts and Gelissen (2002)). Feminist scholars have emphasized a lack of a systematic discussion about the family as welfare provider and its implications on the gender division of paid and unpaid work (e.g. Lewis 1992; O'Connor 1996). Time use surveys represent a fundamental tool for analysing these dimensions which are, otherwise, difficult to capture mainly due to their invisibility in national accounts.

Time use studies have mostly focused on the gender division of labour (Bianchi et al. 2012; Miranda 2011), showing the existence of a significant gender gap in unpaid work, especially in households with young children (e.g. Apps and Rees 2005; Anxo et al. 2011). Women, beside their increasing participation in the labour market, continue to specialize in domestic work. This argument has raised concern about the existence of a *double shift* or a *dual burden* (Hochschild 1989; Hill et al. 2004) and of a consequent *time squeeze* for women (Hochschild 1997; Clarkberg and Moen 2001). A recent branch of time use research has been focusing on gender differences in total work (the sum of paid and unpaid work) rather than on the gender division of labour. Burda et al. (2008) analysed time use diaries for Germany, Italy, the Netherlands and United States. Results highlighted the existence of similar patterns of total work by gender in all countries with the exception of Italy, where men work significantly less compared to women. According to the authors, the main reason behind the "excess of work" performed by Italian women is to be found in the considerable amount of time spent in cleaning the house. A subsequent study based on time use data for 27 countries (Burda et al. 2013) found evidence for similar hours devoted by men and women to total work in rich non-Catholic countries, terming this phenomenon "iso-work". A recent article confirmed that iso-work does not hold in predominantly Catholic countries and suggested the existence of specific time use patterns for Mediterranean ones, where stringent gender roles persist mostly due to social norms (Gimenez-Nadal and Sevilla 2014). The study based on Spain showed the existence of a gender gap in total work in 2002 and 2009 of 4.3 and 6.3 hours per week, respectively. Given the 24 hours budget constraint, high levels of total work

result in less disposable time for leisure and personal care.

Recently a new line of inquiry in time use research moved beyond the traditional analysis of gender differences in time use analysing the consumption, in addition to the production, of unpaid work and allowing for measures of non-monetary transfers (e.g. Zagheni and Zannella 2013; Hammer et al. 2015; Zagheni et al. 2015). Those studies show the existence of large flows of non-market resources from women to men during virtually all stages of life, although with significant differences across countries. Previous research also highlighted the existence of very similar qualitative and quantitative gender-specific age profiles of household production and transfers in Italy and Spain (e.g. Zagheni and Zannella 2013). Hammer et al. (2015) analysed market and non-market work for a set of European countries confirming the existence of both relatively low gender disparities in labour income in Slovenia and of considerably high ones in terms of unpaid work in Mediterranean countries.

This article builds on time use data to explore cross-country differences between Austria, Italy and Slovenia in unpaid labour and its implication in terms of gender division of work and intergenerational transfers. The study contributes to the existing literature in three main regards. First we estimate the consumption, in addition to the production, of unpaid productive time. The difference between production and consumption serves as a measure of non-market transfers across ages and genders. Second, combining estimates for paid and unpaid work by age and gender, we evaluate whether a gender gap in total work exists in the three countries or not. Comparing Slovenia with Austria and Italy is of particular relevance to test the hypothesis of the absence of iso-work in catholic countries. Finally, we develop a measure of the rush hour of life, i.e. the age span during which the combination of familiar and professional responsibilities results in large amounts of total work and, hence, little disposable time for leisure and personal care.

### 3. Data

The comprehensive analysis of non-market activities became possible with the introduction of time use surveys (TUS). For these surveys the participants record their activities in a so called time diary during one (Austria and Italy) or two days (Slovenia) of the week. The diaries have a grid with 10-minute time intervals (15 minutes for Austria). Among demographic and socio-economic characteristics of individuals and households there are also variables about age and gender which enables us to calculate averages by age (i.e. age profiles) for both genders. Available is also basic information on where the activity was performed and with whom. Sometimes more activities are performed in parallel, for example, taking care of children while cooking. Although data provide primary and secondary activity we are focusing only on primary activity. This way the total work does not exceed 24 hours per day, and we are more comparable with other studies that often do not have information on secondary activity available in the data. The surveys provide weights taking into accounts different probabilities of households to be selected in the sample and non-response – and we are using them in the analysis<sup>1</sup>.

The reported activities are grouped into larger but still quite detailed categories. By using the national time use surveys we can provide more detailed insight into people's activities than it is possible from international data sources like the Multinational Time Use Study (MTUS) or Harmonized European Time Use Survey (HETUS), where for comparability reasons categories of time use are already aggregated to a certain level.

In the last decades TUS have been conducted in many countries, although with different regularity. Our analysis builds upon the time use survey data conducted by national statistical offices in 2008 (Austria and Italy) and 2000 (Slovenia). Unfortunately, there is no more recent time use survey available for Slovenia and,

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<sup>1</sup> Because the weights provided in the Austrian time use survey underweight persons with small children we use weights from the microcensus and adjust them so, that the weighted survey population fit the population by age, sex and by the number and age of their own children.

hence, we have to keep this time difference of 8 years between the Slovenian and Austrian/Italian survey in mind when interpreting the results. The sample size is 8,234/44,606/6,190 individuals (representing 0.10/0.07/0.31 percent of the total population) and 4,757/18,250/2,364 households for Austria/Italy/Slovenia, respectively. In Slovenia each respondent has recorded his/her activities on two different days, so the number of records is about double the sample size reported above. In Italy diaries were filled in by all members of the household aged 3 years and over<sup>2</sup>, while in Slovenia and Austria only persons aged 10 years and over were interviewed. To be comparable across countries we include also for Italy only persons aged 10+. People below that age are anyway providing very little paid or unpaid work. In Italy the full structure of the households by age and gender is available in the survey whereas in Austria this is possible by linking survey data with the census data. In Slovenia none of this is the case and therefore we cannot allocate production in the households to individuals below age 10. Therefore, for Slovenia we will use the relative age profile of consumption calculated for Italy<sup>3</sup> and adjust it to the aggregate production in Slovenia.

A first step in our analysis consists in distinguishing the activities which classify as unpaid work from other activities on which people spend time. Our guideline is the third party criterion (Reid, 1934), according to which an activity counts as unpaid work if you could pay someone else to do it. This criterion excludes from unpaid work activities like eating, sleeping, leisure etc. In general, the category of unpaid work comprehends all activities that would be included in the aggregate production of SNA if they were performed for wages on the market instead of by unpaid work.

We group activities from the surveys to meaningful larger groups in line with the HETUS classification and the purpose of our analysis. A large majority of unpaid work is taking place within households. In Table 1 they are presented as 'Housework' including activities related to cooking, cleaning, doing laundry, shopping, gardening and pet care, construction and repair and few remaining

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<sup>2</sup> Diaries for children in pre-school ages were filled in by their parents.

<sup>3</sup> We chose Italy instead of Austria since it has a much larger sample size compared to Austria.

activities. We will present detailed decomposition of housework by those activities later. Here we separately present 'Childcare', 'Adultcare' and 'Voluntary'<sup>4</sup> work that can take place outside the households and unlike for other unpaid work the producers of those services we will exclude from consuming their own services. The category 'paid work' includes working time at the main job and possible second job (at home) but also travel to/from work, lunch breaks, coffees and other breaks during the working time. 'Education' can be in formal form of attending classes, devoting time to homework and study but also free time study. The main component of 'Personal care' is sleeping, but it includes also lying sick in bed, eating, washing and dressing. Finally, 'leisure' comprises activities related to sports, hobbies, games, mass media, social life activities, cultural events, resting etc.

Table 1 gives a general overview about the average time use by age and gender in the three countries. On average, people spend most of the time (about 11 hours per day) in personal care activities such as sleeping and eating. Other important activities are leisure, paid work and housework. The amount of time which is on average devoted to these activities depends strongly on the age and sex of individuals. Rather little time is devoted to adult care and voluntary work: on average between 3 and 5 minutes per day to adult care and between 5 and 12 minutes to voluntary work. For identifying which differences across gender, age and countries are statistically significant we present in Appendix Table 4 standard error of means. In general, the gender differences in personal care are not significant in Italy and Slovenia, whereas for housework, childcare, paid work and leisure the gender differences are highly significant in all countries and all age groups.

The values presented in Table 1 are averages for the population. However, not all individuals have devoted time to all groups of the activities on the day they have recorded their time use and filled out the time diary. A decomposition of the

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<sup>4</sup>'Voluntary work' represents activities like work for and through the organisations (as charity organizations) and informal help provided to other households – for example food management, household upkeep, gardening, shopping.

average number of minutes spent on different activities into a) the share of individuals involved in certain activity and b) the average time spent on the activity out of those who were involved in that activity can be found in Appendix Table 5. We present the results only for components of unpaid work<sup>5</sup>.

In all three countries, more than 90% of all women provided household work during the 24-hour time diary, whereas for men the share was between 67% in Italy and 78% in Slovenia. The remaining gender differences are among those who provided housework, being the largest in Italy with 319 minutes per day for women housework provider and the lowest for male housework provider also in Italy with only 157 minutes per day. Considerable amount of time was devoted to childcare between ages 25-39 when about one half of women and somewhat less than one third of men provided such activities (Appendix Table 5). Similar are also the relative gender differences in this age group for those who provided childcare, for women ranging between 135 minutes in Slovenia and 182 minutes in Austria, whereas for men they are between 91 minutes in Slovenia and 106 minutes in Austria. Elderly aged 60+ are in Slovenia in greater share involved in childcare (grandparents) than in Austria and Italy, but minutes per provider are lower compared to the other two countries. The low per capita values of time devoted to adultcare presented in Table 1 (between 2 and 5 minutes per day) are mostly explained by the scarce involvement in this activity (only 3 to 8% of people providing adultcare). However, those who did provide adultcare spent around 60 or more minutes per day on those activities. Similarly, the share of individuals involved in voluntary work is only 5 to 8% but per provider the range is between 94 and 152 minutes per day.

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<sup>5</sup> The decomposition of other categories is less relevant for our analysis. Also, practically everybody spent some time for personal care and leisure therefore the shares would be close to 100% and minutes per provider would be very close to minutes per capita.

**Table 1 Average Time Use by Age, Gender and Activity in Minutes per Day**

	Austria - Men					Austria - Women				
	10-24	25-39	40-59	60+	Total	10-24	25-39	40-59	60+	Total
Unpaid work	60	134	150	224	143	108	296	285	318	260
Housework	52	94	127	206	120	88	198	253	299	222
Childcare	3	33	13	5	14	14	91	22	9	33
Adultcare	1	1	2	2	2	1	2	5	4	3
Voluntary	4	6	8	11	7	5	5	5	6	5
Paid Work	162	411	360	38	260	128	248	220	13	154
Education	203	10	4	2	47	193	16	5	2	41
Personal Care	657	593	622	732	646	677	625	640	725	666
Leisure	354	288	299	439	339	332	252	285	379	311
Other/Unknown	3	4	5	5	4	3	3	5	3	4
<b>Total</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>

	Italy - Men					Italy - Women				
	10-24	25-39	40-59	60+	Total	10-24	25-39	40-59	60+	Total
Unpaid work	31	84	120	190	115	90	312	358	349	303
Housework	26	55	94	166	92	75	225	316	324	260
Childcare	1	23	17	6	13	8	80	27	9	30
Adultcare	2	2	4	7	4	2	2	7	6	5
Voluntary	2	4	5	11	6	5	5	8	10	8
Paid Work	90	392	371	55	246	57	212	183	14	118
Education	232	14	1	1	44	240	19	2	1	42
Personal Care	700	669	659	742	690	709	672	659	730	691
Leisure	386	280	287	451	345	342	223	236	346	283
Other/Unknown	2	1	2	1	1	3	2	2	1	2
<b>Total</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>

	Slovenia - Men					Slovenia - Women				
	10-24	25-39	40-59	60+	Total	10-24	25-39	40-59	60+	Total
Unpaid work	82	163	193	242	169	119	307	330	358	286
Housework	69	121	169	216	143	100	225	307	336	249
Childcare	2	29	7	10	12	13	73	13	12	28
Adultcare	2	3	4	3	3	2	3	4	5	4
Voluntary	9	10	13	13	11	4	6	6	5	5
Paid Work	89	352	288	53	209	67	249	212	22	145
Education	193	15	2	1	50	210	17	4	1	50
Personal Care	669	612	625	696	646	676	619	625	699	652
Leisure	400	293	326	444	359	362	242	265	357	302
Other/Unknown	7	6	6	5	6	5	6	5	4	5
<b>Total</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>	<b>1440</b>

**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia (2000)

## 4. Method

National Transfer Accounts allocate the SNA aggregates to age-groups and additionally provide estimates of private transfers, e.g. from parents to children. Intergenerational transfers originate from the fundamental nature of the economic life cycle with periods of economic dependency at the beginning and end of life. A person is defined as economically dependent if the labour income falls short of the value of consumption. Age profiles (age averages) of labour income together with the age profiles of consumption constitute therefore key age schedules in NTA that will determine the reallocation of resources across age. If total consumption of a certain age-group (e.g. children, retirees) is higher than labour income the difference has to be financed through age-reallocations in form of transfers (public and/or private) or through asset based reallocation (e.g. asset income, dis-saving). The surplus of consumption over individual's production in childhood and old age is financed by prime age adults who produce more through the market than they consume.

Despite of the qualitatively similar pattern across countries (periods of dependency in young and old age that have to be sustained by the population in working age) there are relevant differences among countries regarding the lengths of periods with life cycle deficits and surpluses, but also in the size and structure of the transfers as well as in the importance of asset reallocation (savings, loans etc.) (Lee and Mason 2011).

Production and consumption in the SNA, and consequently NTA, are measured by the monetary value of the goods and services, i.e. by the price for which they are exchanged in market transactions. For unpaid work we lack this information because neither the work nor the resulting products and services are traded on markets. The usual approach in household satellite accounts is to value unpaid work with wage rates that are received on the market for similar activities. As wages can significantly differ across countries we measure paid and unpaid work in terms of time units, thus in the amount of time devoted to these production activities.

#### 4.1 Age Specific Production and Consumption

Production is observed at individual level, therefore for getting age-specific estimates we simply calculate averages by gender and age. On the other hand, the estimates of age- and gender-specific profiles for the non-market consumption require the introduction of further assumptions.

First we assume that housework is consumed by the household members. And second we need assumptions about the distribution within the households. The basic assumption is that the unpaid housework services are distributed within the household in equal shares, i.e. every household member consumes the same amount. These assumptions are necessary, since it is not observable how much each member of the household really consumes. To calculate the consumption of housework we sum up the time devoted to chores in the household, divide it equally among all household members and calculate the average consumption level for each age group. The consumption age profiles are then adjusted such that aggregate consumption (age averages multiplied by population numbers and added up over all ages) equals the aggregate production.

Childcare is treated differently. Several studies reported that the time devoted to childcare substantially increases in presence of pre-school children (e.g. Anxo et al. 2011). Zagheni et al. (2014) highlighted that the bulk of childcare activities is enjoyed by the children in the first years of their life. The amount of childcare consumption therefore strongly depends on the age of the child. Since younger children usually require more attention this should be reflected in the rule for distributing childcare among the children living in the household. To do so we observe the total amount of time dedicated to childcare by age of the child in households with only one child. Relying on this information, we build age averages of childcare consumption by age of child. The age-averages are used as weights for the distribution of total time devoted to childcare in the household to the children living there. The age profiles are then calculated as age-specific means.

Distributing adult care also follows the rule of equal shares, but with two modifications. First, the production is assigned only to individuals aged 18 years and over. And second, adult care provided to adult members is assigned to the

other adult household members, but not to the provider himself/herself. While we assume that the person consumes part of the meal he/she is cooking, this assumption does not make sense in terms of care as care is by definition provided to other persons. Both adultcare and childcare can be received not only from the members of the same household but also from the members of different households. For the care coming from other households we assume the same age profile as computed for within-household consumption.

Finally, voluntary work is provided to individuals outside the households. We do not have information about who the beneficiaries of this inter-household transfers are. Therefore, for consumption of voluntary work we assume uniform per capita age distribution across all age groups.

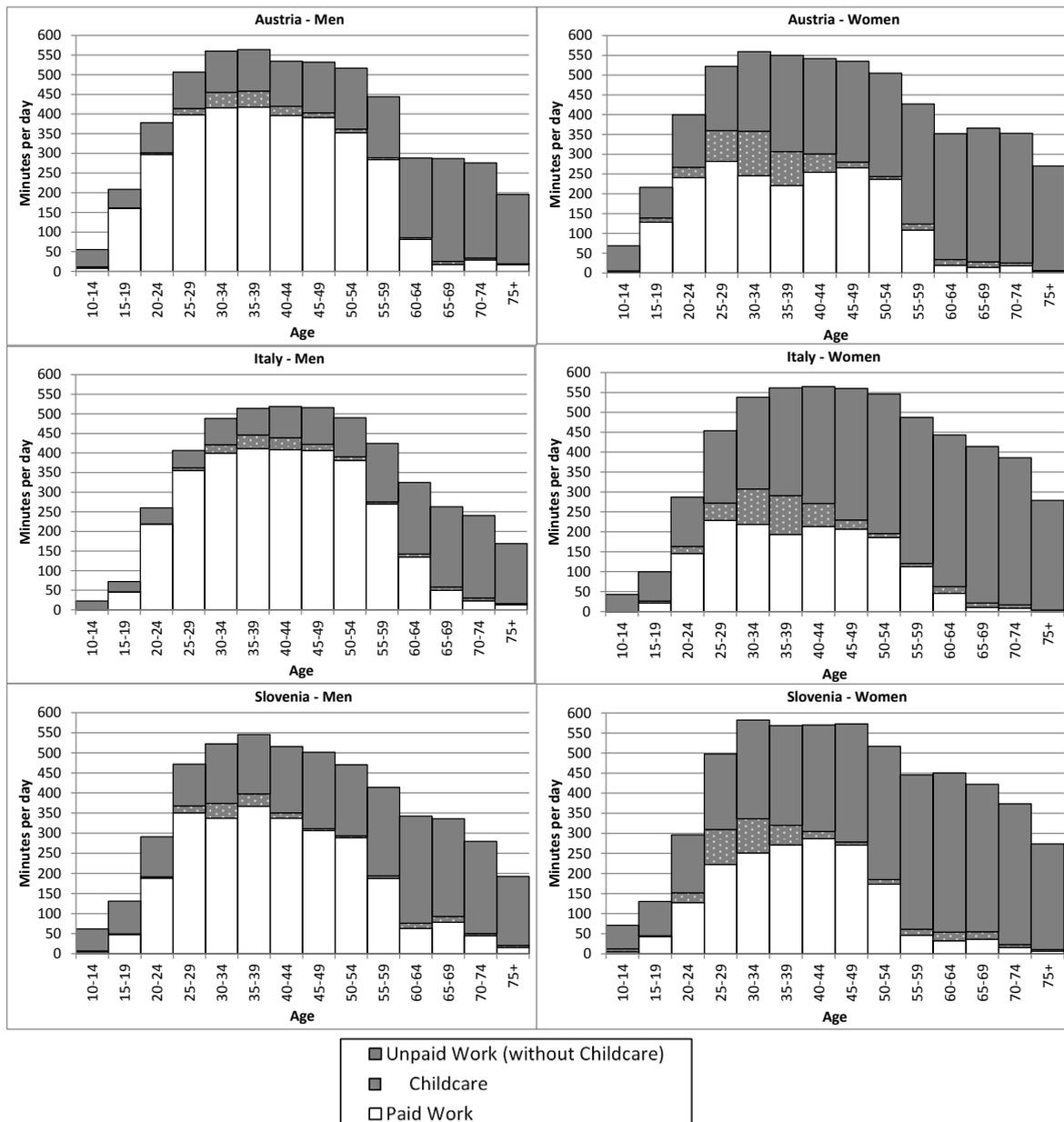
Many time transfers in form of unpaid work are provided to persons of different age, for example, by parents to their children. After having the age profile of consumption and the age profile of production we can calculate the difference between them. People in age groups where production of unpaid work is greater than consumption are transferring their time to age groups where production of unpaid work is smaller than consumption. Thus, by subtracting the age profile of production from the age profile of consumption, we obtain the age profile of net transfers among age groups in form of unpaid work.

## 5. Total Production Activities

Figure 1 plots the average time used for production activities (paid work, childcare and other unpaid work) by age and gender for the three countries. There are remarkable cross-country differences in the total amount of time devoted to production, as well as in the distribution of production between men and women. Among the most distinct results is the smaller amount of time that is devoted to paid work by men in Slovenia compared to the other two countries. While Austrian and Italian men at age 30-49 devote on average about 400 minutes per day to paid work, the corresponding value for Slovenian men is only about 350 minutes. However, Slovenian men compensate less paid work by providing more unpaid

work compared to Austrian and Italian men. Consequently they work on total similar hours as Italian men, but still lagging slightly behind the Austrian men.

**Figure 1 Production Activities by Age and Gender in Minutes per Days**



**Note:** We present childcare separated from other unpaid work

**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia (2000)

Italian women devote on average little time to paid work: about 200 minutes per day in the age from 30 to 49, compared to about 250 minutes in Austria and Slovenia. However, Italian women in working age devote much more time to

housework as compared to Austrian women and slightly more than Slovenian women. The average time women in age group 30 to 49 devote to total production (i.e. the combination of paid and unpaid work) is therefore similar in Italy and Austria, about 550 minutes per day, while in Slovenia it is slightly higher. The qualitative pattern of paid and unpaid work during the working age differs across countries. In Austria and Italy women often reduce the amount of paid work when having young children – either in form of part-time work or withdrawing from the labour market for several years. In Slovenia, on the other hand, women usually return to full-time employment after one year of parental leave, however they retire distinctively earlier compared to Austrian and Italian women. The total amount of work is very stable between age 30 and 49 in all countries, despite different levels of paid work and changing shares of paid versus unpaid work.

During the working age in Austria the total amount of work is about the same for both genders, whereas Italy and Slovenia show a gender gap in total work of about 50 minutes per day favouring women. Our results are in line with previous literature. Burda et al. (2013) document that Italian women work on average 40 minutes longer per day compared to Italian men. Bloemen et. al. (2010) who analyse the time allocation between couples in Italian households in detail point out that there are considerable differences by household characteristics with higher educated men doing more housework and childcare and higher educated women doing less, engaging in turn more in market work. Burda et al. (2013) claim that the iso-work phenomenon (i.e. similar hours worked on total by men and women) does not hold in predominantly Catholic countries. The authors proposed social norms as an explanation. Our results suggest that this explanation does not fit in the cases of Austria and Slovenia. Austria, though being a Catholic country, reported similar amounts of total labour due to the existence of gender specialization. In Slovenia the amount of women's paid work is closer to men than in the other two countries, which reflects historical legacy of socialist system striving for equality – including gender equality. Nevertheless, our results indicate that social norms were different for the unpaid work where gender equality does not hold. Thus, having full time paid jobs and high employment rates has left women with 'double shift' work and squeezing out their leisure time as compared

to men. One explanation for gender equality/inequality in total work can be found in different social and family policies or in the different kind of familialism.

After retirement women in all countries continue to provide much more unpaid work than men. At those ages men are not providing paid work anymore, therefore they are left with more time for leisure and personal care.

**Table 2 Further Decomposition of the 'Housework' Category**

	Austria - Men					Austria - Women				
	10-24	25-39	40-59	60+	Tot	10-	25-39	40-	60+	Total
Cooking	10	18	23	30	<b>20</b>	21	62	78	98	<b>69</b>
Cleaning	13	20	28	45	<b>27</b>	20	48	59	63	<b>50</b>
Laundry	0	3	4	5	<b>3</b>	6	26	35	40	<b>29</b>
Shopping	16	21	26	43	<b>26</b>	25	36	38	43	<b>37</b>
Gardening/Pet Care	5	11	23	51	<b>23</b>	9	19	33	44	<b>28</b>
Construction/Repair	6	17	18	22	<b>16</b>	3	2	3	2	<b>3</b>
Other	1	3	4	9	<b>4</b>	4	4	6	7	<b>6</b>
<b>Total</b>	<b>52</b>	<b>94</b>	<b>127</b>	<b>206</b>	<b>120</b>	<b>88</b>	<b>198</b>	<b>253</b>	<b>299</b>	<b>222</b>

	Italy - Men					Italy - Women				
	10-24	25-39	40-59	60+	Total	10-24	25-39	40-59	60+	Total
Cooking	6	14	21	32	<b>20</b>	25	84	119	127	<b>99</b>
Cleaning	6	11	16	25	<b>16</b>	24	77	100	98	<b>82</b>
Laundry	0	0	1	1	<b>1</b>	3	21	35	40	<b>28</b>
Shopping	7	14	23	33	<b>21</b>	16	30	38	34	<b>31</b>
Gardening/Pet Care	3	5	18	48	<b>20</b>	2	3	9	12	<b>8</b>
Construction/Repair	1	3	5	6	<b>4</b>	0	0	0	0	<b>0</b>
Other	5	11	18	27	<b>16</b>	8	27	27	19	<b>22</b>
<b>Total</b>	<b>28</b>	<b>59</b>	<b>102</b>	<b>172</b>	<b>97</b>	<b>78</b>	<b>242</b>	<b>329</b>	<b>329</b>	<b>270</b>

	Slovenia - Men					Slovenia - Women				
	10-24	25-39	40-59	60+	Total	10-24	25-39	40-59	60+	Total
Cooking	10	15	24	27	<b>19</b>	33	90	124	146	<b>105</b>
Cleaning	19	23	33	45	<b>29</b>	30	50	61	61	<b>54</b>
Laundry	0	1	1	3	<b>1</b>	6	27	37	38	<b>28</b>
Shopping	13	22	30	32	<b>22</b>	20	35	38	33	<b>28</b>
Gardening/Pet Care	20	35	57	79	<b>48</b>	13	24	45	59	<b>38</b>
Construction/Repair	8	25	22	28	<b>22</b>	1	2	2	1	<b>2</b>
Other	2	3	4	5	<b>3</b>	1	2	3	2	<b>2</b>
<b>Total</b>	<b>71</b>	<b>123</b>	<b>172</b>	<b>218</b>	<b>145</b>	<b>102</b>	<b>228</b>	<b>310</b>	<b>341</b>	<b>258</b>

**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia (2000)

Because there are large differences in the average amount of time devoted to housework in the three countries it is interesting to have a closer look at the

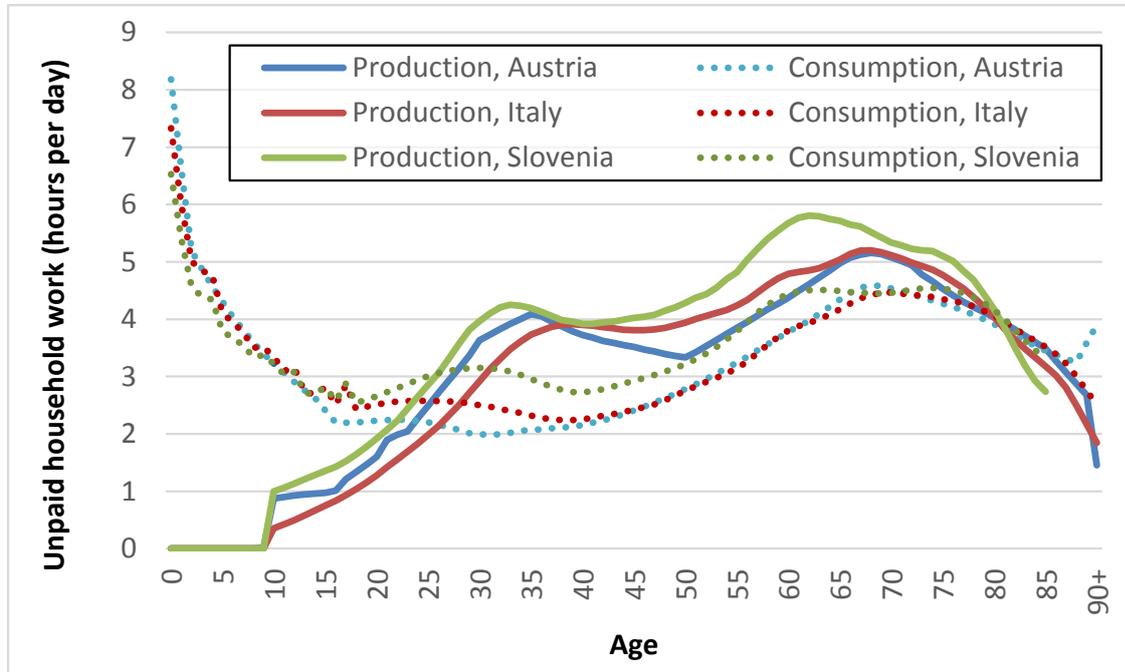
activities in the category housework in Table 2. In all three countries the average amount and type of housework carried out by men is rather similar, except gardening: Slovenian men devote considerably more time to gardening and pet care than Austrian and Italian men. Women spend in all three countries much more time to housework activities than men; the total amount is with an average of 258 and 270 minutes similar in Slovenia and Italy. Slovenian women devote more time to cooking and gardening, while according to previous studies (Burda et al. 2008) Italian women spend more time on cleaning than in the other countries. Austrian women devote with an average of around 222 minutes less time to housework compared to women in the other two countries, which is due to the much lower amount of time used for cooking and the lower amount of time used for cleaning activities.

## **6. Consumption and Transfers**

So far we have presented the age profiles of household production – i.e. the time spent on unpaid household work. Figure 2 presents production and consumption age patterns for all three countries. Production has a clear twin-peak shape. The first peak is related to the childbearing ages in form of childcare. For most categories of unpaid work the increase in higher ages is probably a combination of having more time available for unpaid work (since being retired) and the declining productivity.

Consumption is clearly highest in the first years of life, when humans need the highest amount of care. It is rather low during working life when people provide a large part of unpaid work for their own children. Finally, the consumption increases again in old age when due to retirement and consequently the reduction of paid work people have more time to produce and enjoy domestic activities.

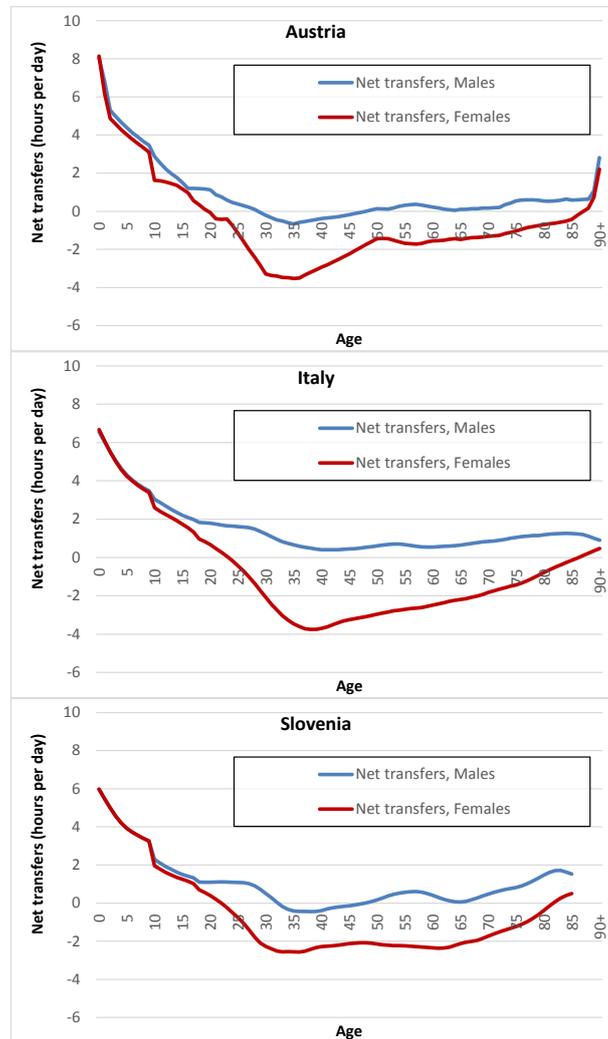
**Fig. 2 Production and Consumption in Form of Unpaid Work in Austria, Italy and Slovenia (Hours per day)**



**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia

The difference between the consumption and production of unpaid work gives a measure for the net transfers in form of unpaid work (see Figure 3). For women production is concentrated in the childbearing ages (childcare) as well as in old age. From about the age of 20 until their 80s women produce more through unpaid work than they consume therefore net transfers are negative. During working age (until about 55) a large part of their production constitutes a transfer to their children, but a large part of their production is also transferred to their partner living in the same household. In Austria for example women at age 30-34 spend about three and a half hours a day providing unpaid work for others, predominantly other household members. In Austria and Slovenia men produce only during their 30s and early 40s slightly more than they consume, whereas at all other ages they rely on the production of their female partners.

**Fig. 3 Male and Female Production and Consumption in the Form of Unpaid Work (Hours per Day)**



**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia

The difference between the consumption and production of unpaid work gives a measure for the net transfers in form of unpaid work (see Figure 3). For women production is concentrated in the childbearing ages (childcare) as well as in old age. From about the age of 20 until their 80s women produce more through unpaid work than they consume therefore net transfers are negative. During working age (until about 55) a large part of their production constitutes a transfer to their children, but a large part of their production is also transferred to their partner living in the same household. In Austria for example women at age 30-34 spend about three and a half hours a day providing unpaid work for others, predominantly other household members. In Austria and Slovenia men produce

only during their 30s and early 40s slightly more than they consume, whereas at all other ages they rely on the production of their female partners.

## **7. Rush hour of life**

Certain periods in life may be very intensive for individuals in terms of paid and unpaid work. For young parents unpaid work in form of childcare may overlap with building up the career and/or studying, setting up their own apartment, providing additional paid work to earn extra money that young families need etc. We want to shed some light to this period of the “rush hour of life” and investigate which other activities are sacrificed during this period. Providing more (paid and unpaid) work leaves us with less leisure and/or time for personal care.

We follow the approach as commonly applied in economic theory and consider that part of the 24 hours a day are spent on sleeping<sup>6</sup>. The remaining hours per day can be spent on paid or household work and leisure. We follow this theoretical approach but we identify the minimum amount of sleep needed based on the actual data. Among the analysed three countries the minimum average amount of sleep was recorded for Austrian males in the age group 30-34 years – 7 hours and 47 minutes. We assume this is a minimum amount of sleep that everybody needs.

The remaining 16 hours and 13 minutes per day are allocated to “work time” (encompassing paid work, unpaid work and education) and “free time” which can be used for leisure activities or personal care activities including sleep above the minimum amount needed. We then compare the free time with the time devoted to work over the age groups. We define “rush hour of life” ages at which people’s free time falls below their work time – i.e. ages, at which the ratio of free time to work time is lower than 1.

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<sup>6</sup> For example, Ehrenberg & Smith 2012 present decisions of an individual about allocating 16 hours per day between hours of work and hours of leisure, whereas the remaining 8 hours per day are assumed to be used for sleeping and other “maintenance activities” and are therefore excluded from the analysis.

**Table 3 Free time relative to work time**

Age	Male			Female		
	Austria	Italy	Slovenia	Austria	Italy	Slovenia
10-14	1.75	1.87	2.18	1.73	1.76	1.95
15-19	1.25	1.80	1.46	1.23	1.49	1.38
20-24	0.99	1.60	1.43	0.97	1.27	1.21
25-29	0.85	1.17	0.91	0.75	0.87	0.81
30-34	0.70	0.92	0.80	0.71	0.66	0.59
35-39	0.70	0.82	0.76	0.73	0.60	0.66
40-44	0.78	0.82	0.85	0.76	0.65	0.67
45-49	0.81	0.85	0.90	0.78	0.70	0.66
50-54	0.87	0.96	1.05	0.89	0.76	0.83
55-59	1.14	1.26	1.31	1.25	0.97	1.13
60-64	2.31	1.95	1.78	1.72	1.17	1.09
65-69	2.32	2.59	1.84	1.61	1.34	1.24
70-74	2.42	2.96	2.41	1.73	1.48	1.53
75+	3.80	4.58	3.94	2.55	2.46	2.49

**Note:** In grey we mark "rush hour of life" – i.e. ages at which the ratio of free time to work < 1.

**Source:** Authors' calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia

In Table 3 the rush hour of life is marked in grey colour. In Austria it lasts from age 20 to 54<sup>7</sup> and there are no gender differences in the length or the intensity of rush hour since during the prime age total work load is about equally distributed among genders, although men are more specialized in paid work and women in unpaid work. For both genders the rush hour of life is most intensive between ages 30-39 when the ratio of free time to work decreases close to 0.7. In Italy and Slovenia the rush hour starts later and there are clear gender differences. For women the rush hour of life lasts longer than for men – in Italy for about 10 years and in Slovenia for about 5 years. Moreover, the rush hour of life is much more intensive for females than males. For males the ratio of free time to work practically does not decline below 0.8, but for females it drops to only about 0.6 during their 30s. Thus, in Italy and Slovenia women sacrifice much more free time to provide all the paid work and unpaid work presented earlier. Interestingly, during the rush hour period the sum of free time to work ratios of both genders combined is very similar in all three countries. For example, for the age group 35-39 the sum of free time to work ratio of both genders combined is 1.43 in Austria (0.70+0.73) and 1.42 in Italy (0.82+0.60) and Slovenia (0.76+0.66). This

<sup>7</sup> We list the lower boundary of the first and the upper boundary of the last 5-year age group at which the ratio of free time to work is below 1.

indicates that there is a certain amount of worktime that has to be provided in different life stages, but the burden can be distributed differently between genders. This distribution is about equal in Austria, whereas in Italy and Slovenia women work more than men and consequently they are left with less leisure time.

In all of the countries men and women above the age of 60 devote most of their time to leisure and personal care. However, women continue to be much more involved in unpaid work than men. Consequently, females are left with much less leisure time than males also at older ages.

## **8. Conclusions**

A novelty in our paper is that we do not only estimate the age-specific involvement in unpaid work, but also derive a measure of the age-specific consumption of these production activities. By combining age patterns of production and consumption we obtain a measure of transfers across age groups in form of unpaid work.

Age- and gender-specific production activities are very different across countries. In Austria the load of paid and unpaid work together becomes similar for both genders whereas in Slovenia and Italy the work load of women even by far surpasses that of men. The composition of women's workload in Italy and Slovenia in turn is inherently different. Slovenian women are strongly involved in paid work, which is characteristic of ex-socialistic countries. After they finish with the work in the formal sector they work another "shift" at home, which is in line with the "double shift" hypothesis known from the literature. The consequence is a high work load of above 550 minutes per day during the entire working period. Italian women use little time for paid work, but they use much more time for unpaid work than women in Slovenia or Austria. Average time devoted to production by Italian women in working age is with about 550 minutes at a similar level as for women in Austria and much higher than the time which is devoted to production by Italian men. Austria shows a more traditional pattern with gender work division – males are more involved in paid work and females more in unpaid work.

The consumption of unpaid work is highest in childhood when children receive intensive care of their parents, in particular mothers. Another peak is in old age, when people have more time to enjoy domestic activities.

Comparing consumption and production shows that there are not only high transfers in form of unpaid work from parents to children but also from women to men in almost all age-groups. These inter-gender transfers in form of unpaid work are particularly high in Italy as a result of the low involvement of men in unpaid domestic work and the large amount of time devoted to unpaid work by women.

From total available time we subtract the minimum amount of sleep needed and distribute the remaining time to work (including paid and unpaid) and free time (leisure and personal care). We explicitly define 'rush hour of life' as age spans in which individual's working time exceeds their free time. The rush hour of life occurs during working age, especially when people have young children, but to certain degree it varies across countries and gender.

In summary, our results suggest that different social norms and institutional arrangements have a marked impact on the formal and informal reallocation system and thereby shape the inequality of production and consumption possibilities across gender and age. Since the ageing of the population demands changes in the transfer systems these already existing inequalities need to be taken into consideration when reforming the welfare state. Most importantly the extended life cycle in industrialized countries (as a consequence of longer life expectancy) needs also a reform in the life cycle of consumption and production activities, including market as well as non-market activities, with the target to dampen and not to foster inequality across generations and genders.

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## Appendix

**Table 4 Standard Error of Mean by activities and age groups**

	Austria - Men					Austria - Women				
	10-	25-39	40-59	60+	Total	10-	25-39	40-59	60+	Total
<i>Housework</i>	4	4	4	5	<b>3</b>	4	4	4	4	<b>2</b>
<i>Childcare</i>	1	2	1	1	<b>2</b>	2	4	1	1	<b>2</b>
<i>Adultcare</i>	0	0	0	1	<b>1</b>	0	0	1	1	<b>1</b>
<i>Voluntary</i>	1	1	1	2	<b>3</b>	1	1	1	1	<b>2</b>
Paid Work	11	11	9	4	<b>7</b>	10	9	7	2	<b>6</b>
Education	10	2	1	1	<b>8</b>	10	2	1	0	<b>7</b>
Personal Care	7	5	4	4	<b>3</b>	6	4	3	4	<b>2</b>
Leisure	8	7	5	6	<b>3</b>	7	5	4	4	<b>3</b>
Other/Unknown	1	1	1	1	<b>1</b>	0	0	1	0	<b>1</b>

	Italy - Men					Italy - Women				
	10-	25-39	40-59	60+	Total	10-	25-39	40-59	60+	Total
<i>Housework</i>	1	2	2	2	<b>1</b>	2	3	2	2	<b>1</b>
<i>Childcare</i>	0	1	1	0	<b>0</b>	1	2	1	0	<b>1</b>
<i>Adultcare</i>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>
<i>Voluntary</i>	0	1	1	1	<b>0</b>	1	1	0	1	<b>0</b>
Paid Work	3	5	4	2	<b>2</b>	3	4	3	1	<b>1</b>
Education	4	1	0	0	<b>1</b>	4	1	0	0	<b>1</b>
Personal Care	3	2	2	2	<b>1</b>	3	2	2	2	<b>1</b>
Leisure	3	3	3	3	<b>2</b>	3	3	2	2	<b>1</b>
Other/Unknown	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>

	Slovenia - Men					Slovenia - Women				
	10-24	25-39	40-	60+	Total	10-24	25-	40-59	60+	Total
<i>Housework</i>	3	4	4	5	<b>2</b>	3	4	4	4	<b>2</b>
<i>Childcare</i>	0	2	1	1	<b>1</b>	1	3	1	1	<b>1</b>
<i>Adultcare</i>	0	1	0	1	<b>0</b>	0	0	0	1	<b>0</b>
<i>Voluntary</i>	1	1	1	2	<b>1</b>	1	1	1	1	<b>0</b>
Paid Work	5	8	6	4	<b>4</b>	5	6	6	2	<b>3</b>
Education	6	2	1	0	<b>2</b>	6	2	1	0	<b>2</b>
Personal Care	4	3	3	3	<b>2</b>	4	3	3	3	<b>2</b>
Leisure	6	5	4	5	<b>3</b>	5	4	4	4	<b>2</b>
Other/Unknown	1	1	1	1	<b>0</b>	1	1	1	1	<b>0</b>

**Source:** Authors calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia

**Table 5 Share of providers and minutes per provider by sub-groups of unpaid work**

	<b>Austria - Men</b>					<b>Austria - Women</b>				
	<b>10-</b>	<b>25-39</b>	<b>40-59</b>	<b>60+</b>	<b>Total</b>	<b>10-</b>	<b>25-39</b>	<b>40-59</b>	<b>60+</b>	<b>Total</b>
	Share of providers					Share of providers				
<i>Housework</i>	56	74	76	89	<b>74</b>	71	95	97	97	<b>92</b>
<i>Childcare</i>	3	31	17	6	<b>15</b>	9	51	20	9	<b>22</b>
<i>Adultcare</i>	1	2	4	3	<b>3</b>	2	4	8	5	<b>5</b>
<i>Voluntary</i>	3	4	6	9	<b>6</b>	4	3	5	7	<b>5</b>
	Minutes per provider					Minutes per provider				
<i>Housework</i>	92	126	166	230	<b>162</b>	122	206	261	305	<b>240</b>
<i>Childcare</i>	88	106	78	81	<b>93</b>	147	182	107	101	<b>149</b>
<i>Adultcare</i>	49	64	57	74	<b>62</b>	58	48	71	74	<b>67</b>
<i>Voluntary</i>	125	149	127	117	<b>127</b>	101	135	99	85	<b>100</b>

	<b>Italy - Men</b>					<b>Italy - Women</b>				
	<b>10-</b>	<b>25-39</b>	<b>40-59</b>	<b>60+</b>	<b>Total</b>	<b>10-</b>	<b>25-39</b>	<b>40-59</b>	<b>60+</b>	<b>Total</b>
	Share of providers					Share of providers				
<i>Housework</i>	39	64	72	83	<b>67</b>	68	93	98	94	<b>91</b>
<i>Childcare</i>	1	24	21	7	<b>15</b>	5	48	27	8	<b>23</b>
<i>Adultcare</i>	2	3	6	8	<b>5</b>	3	7	13	7	<b>8</b>
<i>Voluntary</i>	2	3	4	9	<b>5</b>	4	6	9	10	<b>8</b>
	Minutes per provider					Minutes per provider				
<i>Housework</i>	73	123	157	207	<b>157</b>	124	327	351	349	<b>319</b>
<i>Childcare</i>	53	93	81	94	<b>87</b>	164	167	98	109	<b>134</b>
<i>Adultcare</i>	110	65	66	86	<b>76</b>	59	34	56	83	<b>59</b>
<i>Voluntary</i>	137	123	109	125	<b>121</b>	105	86	96	103	<b>98</b>

	<b>Slovenia - Men</b>					<b>Slovenia - Women</b>				
	<b>10-24</b>	<b>25-39</b>	<b>40-</b>	<b>60+</b>	<b>Total</b>	<b>10-24</b>	<b>25-</b>	<b>40-59</b>	<b>60+</b>	<b>Total</b>
	Share of providers					Share of providers				
<i>Housework</i>	66	77	83	88	<b>78</b>	80	96	98	97	<b>94</b>
<i>Childcare</i>	5	31	12	13	<b>15</b>	9	54	19	15	<b>24</b>
<i>Adultcare</i>	3	5	7	4	<b>5</b>	5	9	8	5	<b>7</b>
<i>Voluntary</i>	6	6	8	10	<b>7</b>	4	5	7	5	<b>5</b>
	Minutes per provider					Minutes per provider				
<i>Housework</i>	105	157	204	246	<b>182</b>	125	234	312	346	<b>267</b>
<i>Childcare</i>	48	91	60	78	<b>78</b>	138	135	69	84	<b>113</b>
<i>Adultcare</i>	72	58	52	71	<b>60</b>	52	38	54	87	<b>55</b>
<i>Voluntary</i>	160	156	165	127	<b>152</b>	89	107	84	99	<b>94</b>

**Source:** Authors calculations on Time Use Surveys for Austria (2008), Italy (2008) and Slovenia