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Who Cares Who Works?
The Role of Paid and Unpaid Work on the Austrian Labour Market

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Abstract

In Austria more than 70% of the unpaid workload that is cleaning, cooking and taking care of others is provided by women. Albeit feminist economists have been pointing out its importance for decades, unpaid labour and its role both in economic theory and politics has been neglected. Therefore, in this thesis, I investigate how various socioeconomic characteristics affect how men and women allocate their time between paid and unpaid labour and where significant differences lie. In doing so I make use of the time use survey as well as the labour force survey conducted by Austria's Federal Statistical Office in 2008. In attempting to shed light on the prevailing imbalance in labour division, I conduct an extensive literature review, descriptively explore the data and run both OLS and logit regressions. Both on the extensive and intensive margin of paid labour market participation and care work, children and education play crucial opposing roles, especially so for women. The fact that household work rests mostly on female shoulders, on the other hand, seems arbitrary. However, feedback effects between time spent on paid and unpaid work and a certain cyclicality indisputably affect the way we choose to spend our time.

Zusammenfassung

In Österreich werden mehr als 70 % der unbezahlten Arbeit, also Putzen, Kochen und Pflege, von Frauen geleistet. Obwohl feministische Ökonom*innen schon seit Jahrzehnten auf die Bedeutung unbezahlter Arbeit hinweisen, wurde und wird ihre Rolle sowohl in der Wirtschaftstheorie als auch in der Politik vernachlässigt. Daher untersuche ich in dieser Arbeit, wie sich verschiedene sozioökonomische Merkmale darauf auswirken, wie Männer und Frauen ihre Zeit zwischen bezahlter und unbezahlter Arbeit aufteilen und wo hierbei signifikante Unterschiede liegen. Dabei stütze ich mich auf die Zeitverwendungs- sowie die Arbeitskräfteerhebung der Statistik Austria aus dem Jahr 2008. Um das vorherrschende Ungleichgewicht in der Arbeitsteilung zu analysieren, führe ich eine umfangreiche Literaturrecherche durch, untersuche die Daten deskriptiv und führe sowohl OLS- als auch Logit-Regressionen durch. Sowohl für das extensive als auch das intensive Erwerbs- als auch Betreuungsarbeitsangebot spielen Kinder und Bildung entscheidende, gegensätzliche Rollen – insbesondere für Frauen. Die Tatsache, dass die Hausarbeit hauptsächlich auf den Schultern von Frauen lastet, scheint dagegen willkürlich. Rückkopplungseffekte zwischen bezahlter und unbezahlter Arbeit und eine gewisse Zyklizität beeinflussen jedoch unbestreitbar die Art und Weise, wie wir unsere Zeit verbringen.

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Introduction

> "*Women's rights will not be fulfilled, unless the gender gap in unpaid care and domestic work is recognized and closed*." (Elson, 2017)

Women and especially mothers spend more time on unpaid work than men (unstats, 2020). Therefore, with time being a finite resource, women are forced to either work more hours in total or to reduce time spent on the paid labour market. It seems that, while bold, the statement above points to an important aspect of gender equality. So why do we as economists spend so little time on the topic of unpaid labour? There are two reasons that come to mind. First of all, in the pursue of increased efficiency and growing welfare, economists generally focus on optimisation: How can time best be spent to maximise personal wellbeing and economic output? Sometimes, however, amidst variables of interest, regression models and equilibria, using money as a metric distorts our perception of society and leads us to disregard aspects that are difficult to attribute monetary value to. Secondly, leaving unpaid domestic and care work out of account will not only lead to more manageable models but will, on a political level, allow for some leeway to deflect responsibilities. As Parks put it:

> "*until we address caretaking needs as a social, and not an individual problem – the state will continue to be a 'free rider', using women's care work as an unrecognized subsidy that releases it from economic and moral responsibility for citizens with dependencies*." (2003)

Dismissing within household labour division as a personal issue or as economically irrelevant obscures both micro- and macroeconomic structures that determine the functionality of the labour market (Elborgh-Woytek, 2013). Therefore, this thesis aims at tackling the topic of unpaid work in the context of Austria by answering three questions:

I. What role does unpaid work play in the economy as well as economic science?
II. How do Austrian men and women divide their time between paid and unpaid labour?
III. How do various socioeconomic characteristics affect paid and unpaid labour supply of men and women both along the extensive and intensive margin?

In the first part of this thesis, my focus lies on embedding the concept of unpaid work in theoretical frameworks end empirical studies. Drawing on existing literature, I introduce

the concept of assessing the value of unpaid work (Ironmonger, 1996; Jokubauskaitė and Schneebaum, 2021; Ironmonger and Soupourmas, 2009), present the role of domestic and care work in different theories (Akerlof and Kranton, 2000; Becker, 1985; Elson, 2017; Folbre, 1994, 1995; Fortin, 2005; Siminski and Yetsenga, 2021) and showcase empirical results capturing the effects on labour market outcomes such as wages (Alonso et al., 2019; Blau and Kahn, 2017; Cunningham, 2007; Ferrant et al., 2014; Jaumotte, 2004; Jessen, 2022; Lilly et al., 2007; Raley et al., 2012; Riederer and Berghammer, 2020). In chapter 3 Data and Empirical Approach, I zoom in on Austria to point out differences and similarities in time use across various population samples using time use survey (TUS) data and elaborate on my methodological approach. In doing so, I lay the ground for taking on my third and last research question. I finally present the factors that appear to influence paid and unpaid labour force participation decisions both on the extensive and intensive margin in chapter 4 Results. Since the predominant labour division has women partaking in unpaid work more often than men, special attention is paid to the effect of household and care work on female and maternal labour market participation rates.

Austria and its far above average part-time rates among mothers constitute an ideal setting to analyse gender gaps in time use as a lot remains to be done to achieve gender equality (OECD, 2022). Even though the last couple of years have seen improvement in gendered differences in the division of paid and unpaid labour[1], investigating co-dependencies of explanatory variables and underlying mechanisms is vital to achieve a deeper understanding of gender imbalances.

Ultimately, this thesis has two aims: Firstly, to find out how working time is allocated between paid and unpaid labour and where/whether there are differences between male and female labour supply. Secondly, to point out the economic and social role of unpaid labour. Whereas the significance of the former in tackling gender inequality is apparent, the latter is especially crucial in the context of economic sciences as it is immensely important not to blindly follow the ideal of increased efficiency but to question the notions

[1] "*Since 2020, the biggest improvement in Austria's score [of the Gender Equality Index, note] has been in the domain of time […]. An improvement in the sub-domain of care activities […] has been the key driver of this change*." (EIGE, 2024)

of value, market and work it is based on and to modify model assumptions if necessary to accommodate concepts such as unpaid labour because as Dowling fittingly points out:

> "*These are activities that, whether acknowledged or remunerated as such or not, constitute work which is of value in economic terms because of its role – not to say necessity – in producing the labour power required for waged labour to be undertaken with its appropriate physical, emotional and mental capacities, dispositions and subjectivities*." (Dowling, 2016)

Literature Review

History

Throughout history and almost everywhere in the world, women did and still do allocate more time to unpaid work than men do (Ferrant et al., 2014). However, the more developed a country is, the more work is substituted away from the informal "household labour market" to the paid labour market. This development is mostly due to a shift in women's work composition (Bridgman et al., 2018; Fang and McDaniel, 2017). Empirical studies further show that the unequal distribution of unpaid work, effectively lowers the female labour market participation and women are coerced to work part-time or in low quality jobs (Ferrant et al., 2014). Therefore, unsurprisingly, the question of who bears the workload of unpaid domestic and care work had and still has a strong impact on feminist economics and its development.

In the fields of economics and politics, unpaid work has not received a lot of attention. Therefore, up until the 80s, the only found mention of unpaid labour in economic models is in the context of time allocation and human capital specialisation. The somewhat simple story that is most prominently told by Nobel laureate Gary Becker goes like this: (married) women generally have more household responsibilities and hence cannot afford to spend the same amount of time and energy on paid work as men do which in turn leads to specialisation among couples concerning paid and unpaid work (albeit segregation might be a more fitting term) leaving most of the domestic workload for women (1985). Even though this narrative is plausible, it is quite unsatisfactory as it does not question gender roles and their prescribed responsibilities but only vaguely ascribes "other forces, including any discrimination against women" (ibid.) to prevailing stigmas.

Around the second wave of feminism, however, the perception of unpaid domestic work shifts (Becchio, 2019). Labour done within the household is no longer seen as merely a decision on human capital investment, and the labour division between men and women as naturally given. Instead, the spotlight is turned on the growing pressure of having to bear a double burden, having to work "a second shift" and the underlying gender inequality (Hochschild and Machung, 1989). The idea of women's economic emancipation no longer exclusively concerns the paid labour market but has found its way to questioning the mechanisms of within household labour division as well. Naturally, social sciences including economics are not left unaffected by this development and a new scientific area called women's studies is born. A prime objective of the expanding literature is to highlight the ambivalence engrained in many an economic model ignoring the value generated through unpaid work:

> "*Women are the source of all labor in that they are the producers of all laborers. This is the basic means of production (reproduction) in any society. It creates the first commodity, female and male laborers, who in turn create all other commodities and products. Men as the ruling class profit from this commodity through its labor."* (Warrior, 2000, p. 532f)

Subsequently, in the early 90s, change within the economic sciences is in the air as the subcategory of feminist economics arises from the broader field of the earlier mentioned women's studies (Becchio, 2019). Marilyn Waring, a prominent voice among feminist economists (see Bjørnholt and McKay, 2014), points out once more the faultiness incurred by economic models that view the services supplied by mostly women as voluntary choice or free of charge for government and head of the households and the arbitrariness of social and economic segregation that comes with them:

> *"Clearly, if you do not perceive parts of the community as economically active, they will not be in your model, and your 'correct conclusions' based on the model will not include them."* (Waring, 1988, p.17) She further states that "*the complex reality of the world is ignored time and again [...]. The basic assumption of all Becker's work is that men (he calls them 'people') always behave rationally. This leads to the baffling implication generally found in this work 'that all outcomes are in some sense optimal,' that is, the best compromise for all the 'people', given all the available options. [...] This approach amounts to a tacit endorsement for the status quo of male domination."* (ibid. p.38)

In this atmosphere of change, the International Association of Feminist Economics is founded. Three years later, in 1995, the journal Feminist Economics follows (Becchio, 2019). A central theme is, of course, unpaid labour. The call for recognition grows louder with estimates of the economic value added by unpaid work being as high as 94% of GDP for Australia (Ironmonger, 1996). Now, thirty years later, publications and working papers on the same topic show that ranking from 22% (Jokubauskaitė and Schneebaum, 2021) to almost 123% (Ironmonger and Soupourmas, 2009) of GDP, the impact of unpaid labour on the economy is still measurable and significant. Moreover, they are indication and reminder that a lot remains to be done.

Theory

Economic theory is, as any other social science, subjected to paradigm shifts. Thus, economists are oftentimes confronted with the ideological question which viewpoint to model. This is, in some way, the beating heart of the social sciences as it allows for discussion and development but, naturally, it is also a reason for caution:

> *"We should be on our guard not to overestimate science and scientific methods when it is a question of human problems; and we should not assume that experts are the only ones who have a right to express themselves on questions affecting the organization of society."* (Einstein, 1966)

Einstein in fact wrote this with economics in mind. It stands to reason that economics are especially prone to this issue due to its nature of trying to bridge social sciences with statistics and mathematics, pouring what we see in the "real world" into models and theories and translating significant findings into policy recommendations. But generating economic models and calculating equilibria requires numeric representations which is why economists rely on concepts such as *utility* and *budget*. While these can be very helpful crutches, they also have to be taken with a grain of salt as they are effectively trying to put a value on everything and anything of economic interest. Therefore, creating and interpreting any model concerning unpaid labour is difficult and different approaches exist, some of which I will introduce in the following chapter.

The Microlevel: Comparative Advantage and the power of attitudes

To analyse unpaid labour on a microeconomic basis, one must consider it in the context of allocating resources, in this case time and effort. The main idea is that individuals can

assign their time to either paid, unpaid or leisure time. Some solutions to this allocation problem rest on the principle of comparative advantage, as for example Becker's approach discussed earlier. Becker hypothesises that (married) women have a comparative advantage in unpaid work that stems from specialized investment in human capital. He argues that households optimizing their utility end up with a labour division that rests on specialisation and leads to women spending more time on unpaid work and self-segregating into low-skilled and low-pay jobs while men are spending all their time on the paid labour market. The underlying assumption of this equilibrium are "increasing returns from investments in specialized human capital". Two possible reasons are provided for why women, and not men, decide to devote their time to childcare work and chores: discrimination or an "intrinsic comparative advantage" (Becker, 1985). Some of the developments of the last couple of decades support the general idea of comparative advantages being at play. Declining fertility rates together with a sharp increase in women's education and changes towards anti-discriminatory policies as well as an increased efficiency of domestic work did effectively lead to a decrease in women's hypothesised comparative advantage concerning unpaid labour and thus to a decrease in their share thereof. But importantly men's share of unpaid labour did not increase accordingly which violates the Beckerian model (Siminski and Yetsenga, 2021). The question remains, however, why women choose to spend more of their time on unpaid domestic and care work than men. The ambiguous explanation Becker offers directly reflects one of the most disputed questions of gender economics: nature or nurture, i.e. how free are these decisions?[2] Lilly et al. make an argument for pre-existing economic or societal conditions. The authors claim that low opportunity costs of leaving the paid labour market create comparative advantages which in turn nudge people, mostly women, into unpaid labour (2007). They thereby follow a similar train of thought but find themselves at the other end of this chicken-and-egg problem as they believe external causes to be the driving factors behind the prevalent labour division of households. A nuanced picture is painted by Alonso et al. who illustrate the conceptual complexity of voluntary choices:

[2]I want to point out that this thesis does not by any means aim to answer this question but it is important to contextualise unpaid work and the economic, political and emotional discussions accompanying the topic.

> "Women may be discouraged from doing paid work as it may cause disutility to her or her family in society. In this case, the decision to do unpaid work at home could be considered as individual 'preference', although it may not be voluntary." (2019).

This notion is incorporated into economic theory by Akerlof and Kranton who introduce the factor *identity* to individuals' utility functions. The main idea is that a new variable, namely *identity* or *sense of self*, is implemented in the decision-making process. This allows economists to keep the base model around time allocation but also account for social norms (Akerlof and Kranton, 2000). Within this adapted model, the anticipated disutility due to "mother's guilt" (Fortin, 2005) or fear of social exclusion can be factored into a mother's decision whether or not to participate in the paid labour market as the new variable captures both external and internal costs of breaking prescribed norms. The authors explicitly take household division of paid and unpaid labour as an example of how identity-based models can help explain seemingly inefficient decisions.

> *"Identity considerations can explain the high shares of housework of wives who undertake a large share of outside work hours. Add to the [...] model two social categories, 'men' and 'women.' Prescriptions dictate that 'men' should not do 'women's work' in the home and 'men' should earn more than their wives. [...] In the amended model, the husband loses identity when he does housework and when his wife earns more than half the household income. Equality of utility is restored when the wife undertakes more housework than her husband."* (Akerlof and Kranton, 2000)

Indeed, many economists (and a lot of non-economists too) have found that social norms and gender role attitudes do in fact have a significant effect on paid and unpaid work. Kleven et al. tentatively suggest that conservative views on motherhood might add to gender differences in child penalties, that is wage gaps after becoming parents (2019). Boelmann, Jessen, Steinhauer and Kleven offer even more assertive evidence by showcasing how culture and upbringing affect fertility, labour market decisions of women and within-couple gender inequality making use of the cultural diversity in Switzerland (Steinhauer, 2018), East and West Germany (Boelmann, 2021; Jessen, 2022) and the United States (Kleven, 2022). Blau and Kahn further show that not only do social norms affect labour market outcomes but there might be feedback effects at play as well: "the division of labor in the family potentially responds to, as well as causes, gender

differences in wages" (2017). All these findings suggest that the incorporation of an identity variable that captures the costs of violating gender norms is a sensible addition to existing economic theory in order to model how and why paid and unpaid work is allocated the way it is. Additionally, contrary to Becker's approach, there is room for development and change as naturally social norms are not set in stone.

The Macrolevel: Unpaid work as public good

The loudest critique concerning unpaid work might be its missing representation. Not only does value generated through unpaid work keep being overlooked in national accounting but macroeconomic theory has little to say about the topic either. This is particularly interesting as especially restrictive fiscal policies are assumed to affect (low-income earning) women's workload of unpaid labour and the gender-based labour division (Elson, 2017). But the only framework I found any mention of unpaid domestic and care work is that of positive externalities. Simply put, the argument rests on the notion explored earlier that reproduction labour is the most basic commodity of every society while simultaneously being unremunerated work that is not performed by everybody although everyone profits from it. Nancy Folbre, an early proponent of feminist economics, brings up the idea of children as public good (1994). While Folbre focusses on childcare, I would argue that the model could easily be extended to unpaid work in general. The main idea is that exerting time and effort to look after children – or provide nourishment and cleanliness for the household if the model is extended to incorporate chores – does not only generate utility for individuals but it creates a positive externality for the economy too.[3] Following the neoclassical concept of public goods, the underestimation of the value generated through this work leads to an undersupply thereof which is expressed in child poverty, an inefficient allocation of resources and a dysfunctional pension system (Folbre, 1994, 1995). Others implicitly support Folbre's theory by accusing the government to be a free-rider of women's unpaid labour (Parks, 2003) or of externalising the costs of social reproduction (Dowling, 2016) and thus increasing women's burden of unpaid work to an uneconomic and inefficient level (Hirway, 2015).

[3]One could and should of course also ask about children's utility. This thesis, however, focusses on the role of women and mothers specifically and it would go beyond its scope to include children's perspectives as well. Yet, an interdisciplinary study on the topic together with educational sciences or sociology might be a worthwhile exploration of a viewpoint that is usually neglected by economists.

Empirics: How unpaid work restricts (women)

What role do economists find unpaid work to play not in theory but empirically, that is in the "real world"? Similar to the topic of attitudes and social norms discussed earlier, it is not easy to pin down causal effects of unpaid work on (paid) labour market outcomes. Some reasons for this are the difficulty to collect data and the lack of (natural) experiments. Nonetheless, recent years have produced a substantial addition to the body of literature and research assessing the current gendered labour division and its economic consequences.

Perhaps unsurprisingly, many researchers find evidence for a negative effect of time spent on unpaid labour on various labour market outcomes. Some of the most exhaustive evidence is brought forward in the form of a comprehensive meta-analysis comprising of thirty-five studies concerning informal care workers and their labour market outcomes. While not all of the individual papers' findings are supported by each other, the authors subsume that all data points towards unpaid care work seeming to have a negative impact on the intensive margin of paid labour force participation (Lilly et al., 2007). Conversely, Raley et al. find that mothers' employment status has a significant effect on fathers' participation in childcare work (2012). Looking not only at care work but at domestic unpaid labour in general, an American panel study spanning three decades provides suggestive evidence that female employment as well as labour market experience positively affects men's participation in unpaid domestic work and women's "support for egalitarian roles between spouses" (Cunningham, 2007). Alonso et al., too, point to the conspicuous connection between paid and unpaid labour of women by exploring counterfactual scenarios in 18 countries to describe the impact a different labour law would have on the respective labour market and economy. These set-ups are supposed to mimic the political situation in Norway which is one of the most egalitarian countries worldwide. The authors find that policies that impact labour division would positively affect not only individual labour market decisions but the economy as a whole as the resource of wo/manpower would be used in a more efficient way (2019).

Albeit this thesis' focus lies on paid and unpaid labour supply along both the intensive and extensive margin, it should also be mentioned that unpaid labour has also been found to affect the gender wage gap. In their seminal paper "The Gender Wage Gap: Extent,

Trends, and Explanations", Blau and Kahn mention the importance of unpaid labour in the matter and further underline the feedback effects that are very likely at play (2017). Female labour market participation, for example, might drive the male share of household work but there is also evidence that this could in turn – perhaps via a change in social norms – affect female labour market participation (Cunningham, 2007). Similarly, the effect of children and culture on within-couple labour division found by a study making use of Germany's divided history, might at least partly be driven by the necessary childcare that accompanies having children and the gender role attitudes that typically come with culture (Jessen, 2022).

> *"From a change in role-thinking, growing self-confidence of women, higher educational attainment, change in laws etc all leading up to increased labour force participation which in its turn keeps the wheel going and feeds back into the former factors."* (Biffl, 1991)

As can be seen, the direction of causality or cyclicality of factors influencing labour division is somewhat unclear, but an effect of unpaid labour is indisputably present in the data. Some economists even go as far as claiming that "gender inequality in unpaid care work is the missing link in the analysis of gender gaps in labour outcomes" (Ferrant et al., 2014; Elson, 2017).[4]

Unpaid Work and the Austrian Labour Market

What is happening in Austria is not too different to what is going on in the rest of the world. Austrian women spend more time on unpaid domestic and care work than Austrian men as I will show in the next chapters. It seems that this affects how much time is spent on the paid labour market both directly and indirectly. It is argued that relatively conservative attitudes lead to the prevalence of the breadwinner model[5] which in turn induces higher child penalties (Kleven et al., 2019) and occupational segregation (Kreimer, 2004; Lamei and Skina-Tabue, 2011). The latter can be subsumed by a single number, the so-called Duncan dissimilarity index. This measure is meant to capture the extent to which men and women are sorted into different market sectors and can be interpreted as the share of

[4] Kleven attributes "most of the remaining gender inequality in developed countries" to child penalties but what are child penalties in employment if not testament to a gender-based division of labour within couples (2022).

[5] Which is short for unequal labour division of paid and unpaid work between men and women.

people who would have to change their current job for there to be exactly the same amount of women and men in every single sector. In Austria, that would be almost 50% which is slightly above the EU average (Hurley et al., 2021). It thus seems that if Austrian women do participate in the paid labour market, they work different jobs than men which directly relates to another Austrian characteristic, namely featuring the second highest part-time rate among women in the Euro area (OECD, 2022). Part-time arrangements are a somewhat difficult economic topic as they are a double-edged sword: on the one hand shorter and more flexible working hours allow parents with young children or people with any other care responsibility to partake in the paid labour market, on the other hand the practice of part-time work adds to the gender-based occupational segregation by compartmentalising mothers into part-time and fathers into fulltime jobs (Elborgh-Woytek et al., 2013). In short, while part-time leads to increasing employment rates of mothers it also leads to a decrease in women's hours worked on the paid labour market. Furthermore, these arrangements often remain beyond the first years of parenthood, once again reinforcing the persistent gender roles and causing women to spend disproportionately more time on unpaid labour than men (Jaumotte, 2004; Riederer and Berghammer, 2020). But what causes part-time in the first place? Even though causal arguments are difficult to pin down, statistical data can at least give some insights into correlations and subjective reasonings. While I will go into these details in the next chapter, I like to anticipate one important factor: time spent on unpaid work.

Lastly, it should be noted how this thesis contributes to both feminist and labour economic research. This paper adds to the existing literature by providing an in-depth analysis of the unpaid domestic and care work performed in Austria and its connection with the paid labour market using time use survey data. Austria lends itself to a particularly intriguing study object as its high part-time rates among mothers together with its comparatively conservative gender role attitudes create a worthwhile basis for economic discussion concerning labour division (Eurostat, 2023b; Ruud et al., 2016). The inclusion of unpaid work as explanatory variable in a regression analysis for labour market participation decisions is rare and has not been done in an Austrian context yet. Thus, this thesis' main contribution is the investigation of the role of unpaid labour in a central European framework with the goal of offering valuable scientific insights and policy implications to target gender inequality.

Data and Empirical Approach

The following chapters are concerned with the empirical analysis of the relationship between paid and unpaid work and its ostensible impact on labour market decisions in Austria. In other words, how do Austrian men and women spend their working time, what drives especially women and mothers to allocate their time between paid and unpaid work and where do their decisions support or perhaps contradict the existing literature?

The most important data sources for this purpose are the time use survey (TUS) and the labour force survey (LFS) both of which are conducted by the Austrian Bureau of statistics. In this thesis, I will be using data from 2008, i.e. from the third wave of the Austrian TUS because this is the year when Austria participated in the Harmonised European Time Use Surveys (HETUS) for the first time (Eurostat, 2024). Data on time use is essential when considering the issue of paid and unpaid labour as it uniquely showcases (work) behaviour of individuals from various socioeconomic backgrounds. Within the HETUS-guidelines, the data is collected by asking individuals to keep a diary about their daily activities for 24 hours. In the Austrian micro census of 2008, part of which was the TUS, children and adults starting at the age of 10 were asked to fill out what their main and secondary activities were, where they performed said activities and with whom for every 15 minutes slot over the course of one day. Once the data is collected, activities are grouped into 7 categories: personal activities, education, paid labour, household tasks, childcare, social interactions and volunteering, and leisure time activities (Ghassemi and Kronsteiner-Mann, 2009). For the sake of completeness, it should be mentioned that participation in the TUS was voluntary, and the data may thus suffer a self-selection bias. However, given the sample size of about 8,200 individuals in roughly 4,700 households and the provision of personal weights to ensure representativeness, this should be no reason for concern.

Since this thesis is first and foremost concerned with paid and unpaid work, the main focus will lie on paid labour as well as household tasks and childcare together with social interactions and volunteering. In doing so, I will follow the definition of unpaid work Alsonso et al. offer in their IMF working paper "Reducing and Redistributing Unpaid Work: Stronger Policies to Support Gender Equality":

> "*Unpaid work—home production or non-market production—is defined as work not compensated by a wage. […] Unpaid work broadly comprises of two areas of activities: (i) care work for children, the elderly and the sick and (ii) domestic chores—cleaning and household upkeep; construction and repairs; cooking and food production; household management and shopping, volunteering. Both categories include the time spent traveling to perform those tasks.*" (Alsonso et al., 2019)

In the context of the TUS, there are four categories which constitute unpaid work:

Household work (*Hhwork*) which includes cooking, kitchen upkeep, cleaning, taking care of the laundry, garden and pets, skilled manual and car-related work, shopping and other services, household management and the respective travel time;

Childcare work (*Childcwork*) comprises of basic services such as supervising, feeding, cleaning and snuggling, studying with children, spending free time with children, accompanying and attending appointments for and with children plus the respective travel time;

Care work (*Cwork*) ~~which~~ captures time spent taking care of adults at home and outside the home together with the associated travel time;

Volunteering (*Volun*) ~~which~~ means formal and informal volunteering such as participating in meetings etc. including the necessary travel time (Statistik Austria, 2009).

For both descriptives and analyses, I only consider time spent on unpaid labour if respondents indicate what they are doing to be their main activity. I do this for two reasons. First of all, the data is coded such that paid labour can only be logged in as the main activity. Since I want to compare time spent on paid and unpaid work, and paid labour is de facto defined by having to spend one's main focus on it, I keep this characteristic for unpaid labour too. Secondly, my data does not suffer any substantial information loss by this restriction as it is less than 1.5% of respondents reported doing unpaid work only as a secondary activity while not working as a main activity.

Descriptives

Unpaid labour is a highly relevant topic for gender and labour economics as the prevailing imbalance in labour division has significant effects. Austria is no exception to this rule. Therefore, this chapter outlines the status quo of the Austrian labour market and the division of time between paid and unpaid work.

In Austria, time use data is collected as a module of the labour force survey. I therefore have information on individuals' socioeconomic characteristics in addition to their time allocation without having to match data. This allows me to illustrate how much time people with different traits spend on paid and unpaid work respectively.

One of the data's most distinct features is the difference between male and female working behaviour. Of the whole pool of respondents, girls and women – who make up about 55% of the sample – spend on average seven hours and 40 minutes per day on work. This includes both paid and unpaid labour. Boys and men, on the other hand, assign roughly seven hours and 15 minutes of their available time to work, i.e. 25 minutes less than their female counterparts. Interestingly, both time spent on unpaid domestic and care work, as well as on paid labour, exhibit gendered differences, albeit in different directions. While boys and men spend almost one hour and 50 minutes more than girls and women on the paid labour market, the female excess time in unpaid labour averages at around two hours and 15 minutes. It is thus both time spent on paid and unpaid labour that drives the gendered imbalance in working behaviour but it is due to unpaid work that women's workload is larger than men's. Since I am concerned with differences and interactions between factors influencing the paid and unpaid labour market[6], I restrict the sample to adults aged 18-60 for all further observations.[7] Within this subsample, women's time spent on unpaid work averages out at roughly five hours per day while men aged 18-60 cook, clean and take care of others about half that time, that is two and a half hours per day.

[6] Since a market in economic terms usually involves a monetary transaction of some kind as well as clearly defined negotiating parties, talking about an *unpaid* labour market is unconventional. I still deliberately choose to use the term in this context because value is generated through unpaid work and transactions take place, albeit not in a conventional fashion.

[7] It is worth mentioning, however, that while gendered differences in both paid and unpaid work persist for this subsample too, the difference in total time spent on work almost vanishes It seems that individuals aged 61 and above, who make up roughly 25% of the sample, contribute strongly to the gendered imbalance as women of that age group spend more than one hour more on work than men. Since paid work is almost irrelevant for this age bracket, women's share of total work increases drastically because, as mentioned above, women's unpaid workload is much larger than men's.

It seems there are substantial differences along the extensive as well as the intensive margin, i.e. men do not participate in the unpaid labour market as much as women, and if they do they spend less time on it. As can be seen in Figure 1, the share of men who spend no or little time on unpaid labour is substantially larger than that of women who do so. While almost two-thirds of men spend zero to two hours per day on unpaid labour, more than two-thirds of women spend *at least* three hours per day on household chores, volunteering, and care work.

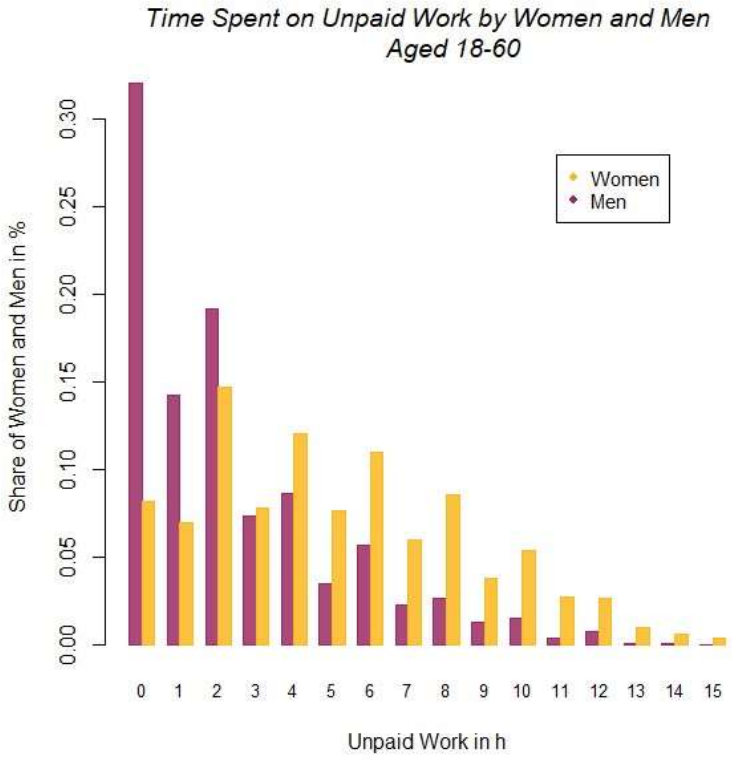

Figure 1. Share of Men and Women spending 0-15 hours per day on unpaid labour
Source: Time Use Survey 2008/09 Statistics Austria

On the paid labour market, however, men spend on average six and a half hours per day working, and thus two and a half hours more than women. Figure 2 provides tentative evidence that this difference might mostly be due to women's tendency towards part-time work as female individuals' time is scattered more evenly between paid and unpaid labour than males'.

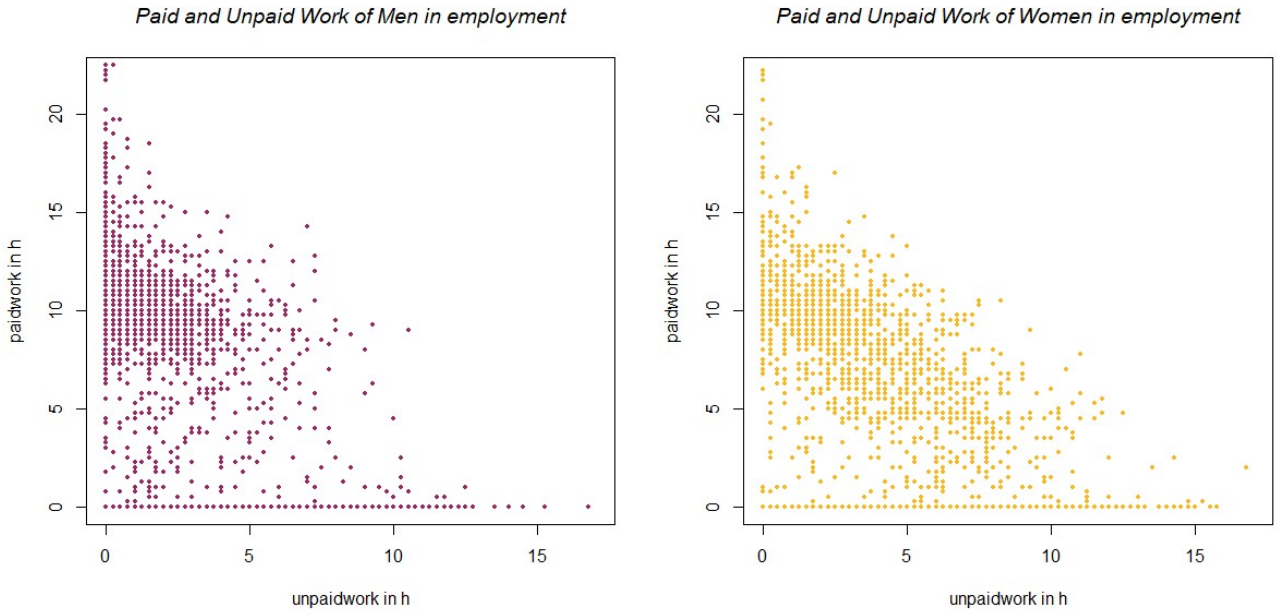

Figure 2. Scatterplot of men's and women's paid (vertical axis) and unpaid (horizontal axis) labour
Source: Time Use Survey 2008/09 Statistics Austria

Perhaps most strikingly, one can see the gender differences when considering only partners who share the same household.[8] Whereas in a single-person household paid and unpaid work will generally be done by one person, it is worthwhile looking into households with more than one adult to facilitate comparisons not only in absolute but in relative terms. Unsurprisingly, the work division is again very uneven in the sense that women spend a lot of time doing unpaid work while men spend more of their working time on paid labour. Effectively, this means that many women are responsible for 50% or more of total unpaid labour, whereas the opposite is the case for paid labour (Figure 3). An index distilling this imbalance into one number is the so-called specialisation index introduced by Siminski and Yetsenga:

> "*It measures whether couples divide their labor in a direction which conforms with sex norms* [...]. *Specifically, it measures the extent to which a female partner specializes in DW* [domestic work, note] *and the male partner in MW* [market work, note]." (Siminski and Yetsenga, 2022)

The specialisation index is calculated by subtracting the female share of paid labour from the female share of unpaid domestic and care work. It thus ranges from -1 (non-traditionalist, i.e. women specialise in paid labour) to 1 (traditionalist, i.e. women

[8] Naturally, this further reduces my sample size since participation in the TUS is not mandatory and there are thus households of which not all members filled out the survey. However, the subsample I am left with still comprises of almost 1,300 households or 2,600 individuals.

specialise in unpaid labour). Households are not specialising at all if the index takes the value 0. The Austrian specialisation index of 2008/09 for individuals aged 18-60 lies at 0.21 with a fairly large standard deviation of 0.48, indicating that Austrian households tend toward a traditionalist work division, but individual differences are large.

Furthermore, the data suggests that in addition to women's share of unpaid labour being consistently higher than men's irrespective of the corresponding household share of paid labour, the marginal rate of substitution between paid and unpaid work might not be the same for women and men either. As an example, if women who bear 40% of the household's paid work take up a higher share of paid work, they will probably decrease their contribution to the household's unpaid labour less drastically than their male counterparts if they were to increase the time they spend on paid work. One possible explanation could be, as mentioned above, that women's rate of substitution is larger in absolute terms than men's (see Figure 3, left-hand side). Moreover, it can also be seen as a supporting argument for Akerlof and Kranton's "Economics and Identity" who ascribe this phenomenon of imbalance to preferences formed by societal rules and gender norms (2000). That is, if a woman is to pick up a higher share of the household's paid labour, she will not decrease her share of unpaid labour accordingly as to not diminish her sense of belonging. Vice versa, if the male share of paid labour in the household is reduced, he will most likely not pick up the complementary equivalent of unpaid labour in order not to obtain disutility by hurting his notion of identity.

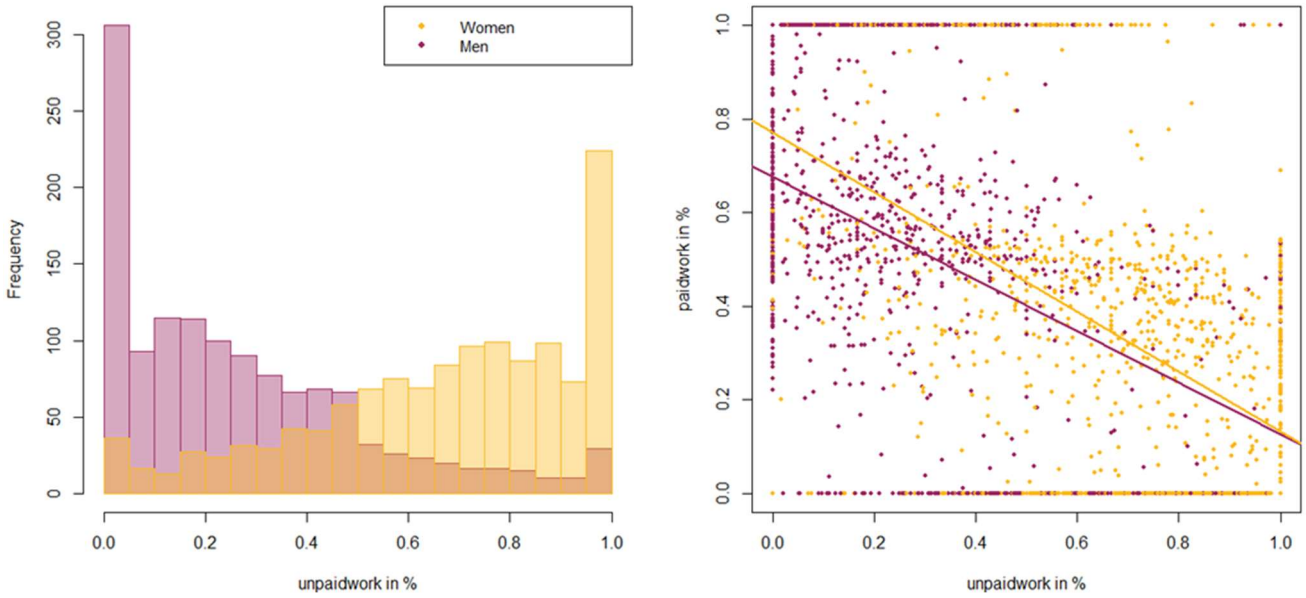

Figure 3. Within household labour distribution. Notes: Using sample without weights
Source: Time Use Survey 2008/09 Statistics Austria

As the mention of substitution rates suggests, there appears to be a clear relation between paid and unpaid labour. Making use of the individual weights provided by the Austrian Bureau of Statistics, I create a representative depiction of this correlation to showcase why looking at unpaid work and the related issues is important (Figure 4). There are two crucial aspects to take from this: First of all, the more time is spent on unpaid work, the lower the expected labour market participation. Secondly, this is an issue mostly affecting women as they bear most of the burden that is unpaid labour. The latter is the reason for the truncated graph of men's labour market participation. The number of men spending more than six hours on cleaning, cooking, and caring for others is too small to be of any significance whereas for women this threshold lies at around nine hours.

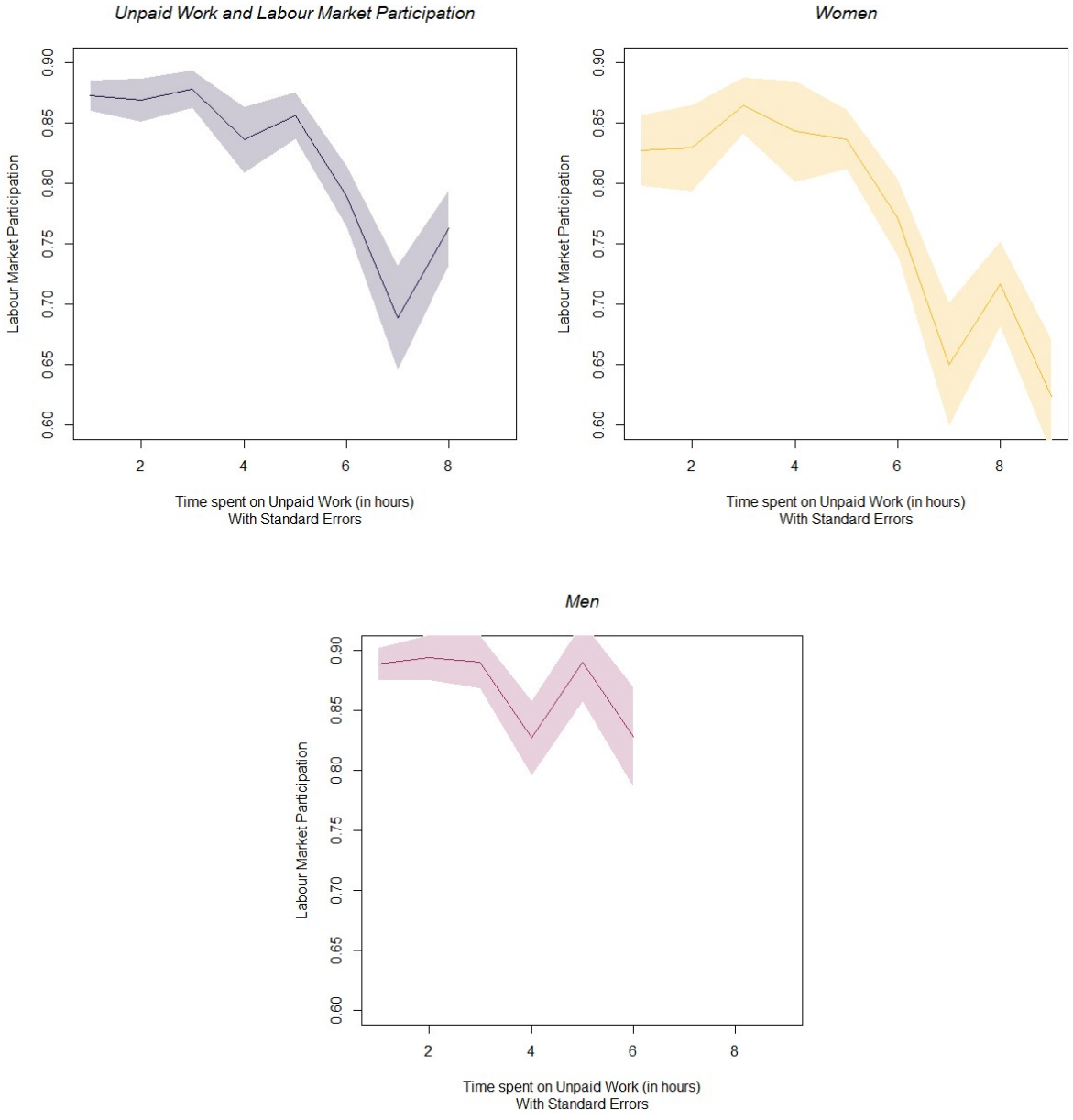

Figure 4. Unpaid work and labour market participation of all individuals aged 18-60, women and men
Source: Time Use Survey 2008/09 Statistics Austria

Clearly, some systemic differences lead to female labour market participation rates being lower than their male counterparts. Throughout this thesis, I argue that unpaid work is one of the factors why this is still the case. In order to do so, I take a closer look at the "anatomy" of unpaid labour and how various population groups are affected differently.

As mentioned at the beginning of this chapter, I differentiate between four components of unpaid labour following the HETUS-guidelines: household work (*hhwork*), childcare work (*childcwork*), volunteering (*volun*), and care work (*cwork*). When considering individuals aged 18-60, the biggest share of unpaid domestic and care work is by far household chores. Moreover, apart from volunteering, these categories feature much higher average hours for women than for men. This tilt in labour division has seen some development over the last couple of decades but, as can be seen in Figure 5, is still persisting (Biffl, 1991).

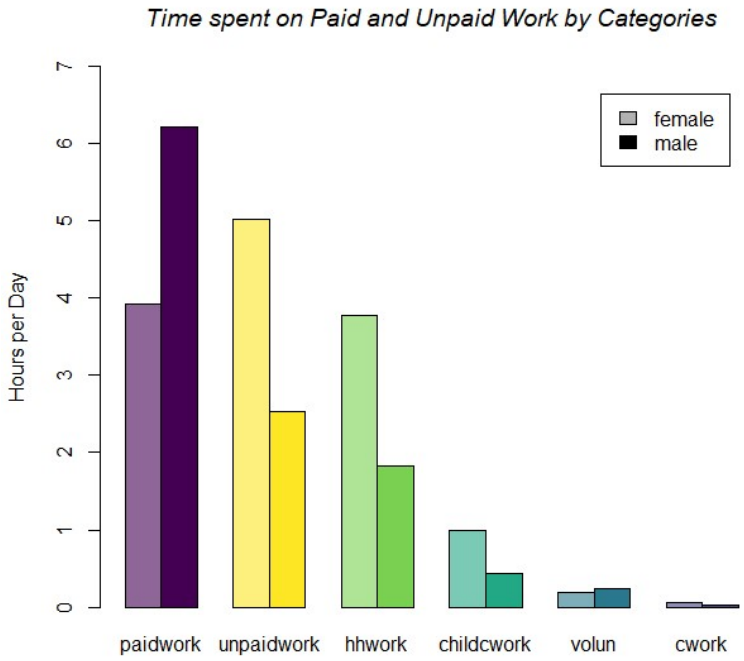

Figure 5. Time spent on paid work, unpaid work, household work, childcare work, volunteering and care work by gender
Source: Time Use Survey 2008/09 Statistics Austria

One factor contributing to this gender imbalance is undoubtedly family status. As already established in previous chapters, children play a huge role in parents' labour market decisions and even more so for women (e.g. Kleven et al., 2019). In exploring the data, I focus on the influence children have on the allocation of time between paid and unpaid work and whether fathers and mothers are affected differently by parenthood. In doing so, it is important to keep in mind that children's age plays a key role – the younger the child,

the more attention it needs. Therefore, Figure 6 contrasts the working behaviour of parents and childless individuals aged 23-43. This age bracket is chosen because parents of at least one child aged three years or younger are on average 33 years old.

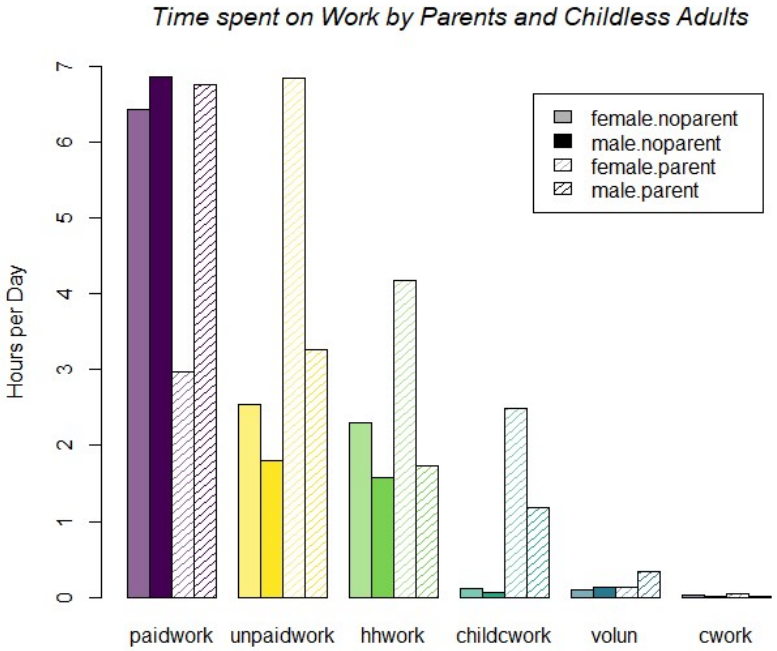

Figure 6. Time spent on paid work, unpaid work, household work, childcare work, volunteering and care work by gender and family status for individuals aged 23-43
Source: Time Use Survey 2008/09 Statistics Austria

In line with many other empirical studies, there seems to be a parenthood effect reducing women's time spent on paid labour by more than three and a half hours. Additionally, mothers allocate much more of their working time to both household and childcare work and have an overall longer workday. While childless individuals work for approximately nine hours per day, parents spend on average ten hours working outside and in the household. Whereas this is almost exclusively driven by an increase in time spent on childcare work for men, it is due to both a substantial increase in unpaid work and a sizeable decrease in paid labour for women[9]. Coincidentally, this correlates with high part-time rates among young mothers (48%) compared to young childless women (15%) or their male counterparts (5% of young fathers and 7% of young childless men). Given that more than half of all people working part-time do so because of care responsibilities

[9] A lot has changed over the last decades regarding women's paid labour market participation and the gender wage gap. However, some general tendencies definitely have not as this 35-year-old quote documents: "Most women without children spend much more time than men on housework; with children, they devote more time to both housework and childcare" (Hochschild and Machung, 1989)

or other personal or family-related reasons (see Table A.1), it seems that there is a strong link between parenthood, employment, and unpaid work. Hence, it is only reasonable to dive deeper into the connection between work status and the division of unpaid labour.

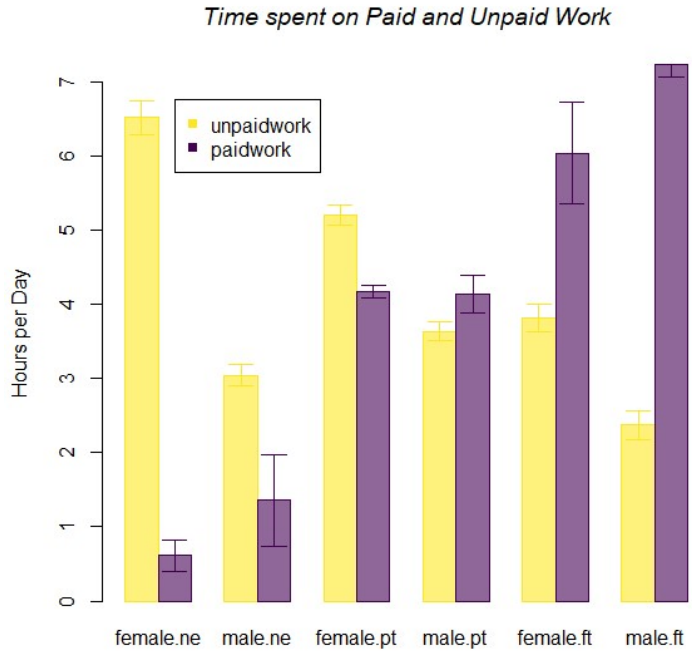

Figure 7. Time spent on paid and unpaid work by individuals aged 18-60 sorted by employment status and gender
Source: Time Use Survey 2008/09 Statistics Austria

Naturally, there is a link between time spent on paid and unpaid work. It is thus unsurprising that people who are not employed (*ne*) have more time available to spend on unpaid labour than people working part-time (*pt*) or fulltime (*ft*). However, it is quite conspicuous that women's and men's time on the paid labour market is roughly the same when split into these three categories and considering standard errors, while the hours they respectively allocate to unpaid labour differ drastically. This disparity is especially noticeable among those without employment. The men of this subgroup spend almost three and a half hours less on unpaid labour than their female counterparts. The imbalance is less pronounced but still marked for those in employment with a difference of one to two hours per day for individuals working part-time and about one and a half hours for fulltime employees. This gender asymmetry can be seen in Figure 7. However, irrespective of the gender differences, it can further be observed that the relation between time spent on paid and unpaid labour almost seems to be inversely proportional which would be supported by empirical findings pointing towards a negative effect of unpaid labour on the intensive margin of labour market participation (Lilly et al., 2007).

To conclude this chapter, let me return to the thesis' figurative thread. The aim of this paper is threefold: firstly, to illustrate the role of unpaid work in our society and economy; secondly, to show who bears the burden of this often overlooked workload and thirdly, to zoom into the economic perspective and analyse which factors affect how much time is spent on unpaid labour and to what extent these effects are different when it comes to labour market participation decisions. The latter will be tackled in the following chapter. The historic and sociological effect of unpaid domestic and care work as well as its influence on economic theory has been described in the context of the related literature. This chapter, however, is concerned with the question of who. We know that men and women currently spend roughly six hours per day on paid labour and that men spend on average more time on the paid labour market than women do (Statistics Austria, 2024a). However, although (feminist) economists have continuously addressed the lack of recognition of the unpaid market sector, little has changed in terms of representativeness in the data. Hence, one of the biggest shortcomings of this thesis is the sheer absence of data since the TUS is conducted so very rarely leaving too much time for guidelines to change and thus making comparisons over time almost impossible. Nonetheless, some features are clearly distinguishable throughout the decades. I use the 2008/09 data to make note of these features. First of all, as of 2008, an Austrian person would spend roughly 3.73 hours per day on household, volunteering and care work or 3.33 hours if they are employed. That is more than half of what an average Austrian employee spends on paid labour. Even if we were to assume that unpaid domestic and care work is performed less efficiently than paid labour due to the absence of surveillance, it is undeniable that the workload made up by cleaning, household upkeep, caretaking, volunteering and many others is substantial and a lot of time and resources flow into it. Secondly, the time needed is to a large extent provided by women who in turn decrease the time they spend on the paid labour market. Thirdly, similar to many other gender-related topics such as the wage or pension gap, family, specifically children, seem to strongly affect parents' division of time but very differently so for mothers. As can be seen in Figure 8, mothers who are not employed spend by far the most time on unpaid labour followed by part-time working mothers and fathers who spend roughly the same amount of time on unpaid work as fulltime working mothers. Fathers who are not employed allocate roughly as much time to unpaid labour as childless women out of employment do. Childless women working

part-time spend some more time on unpaid work than fulltime employed fathers and the least amount of unpaid labour is done by childless men in all kinds of employment.

Coming back to the question of who performs unpaid labour, it cannot be disputed that almost everyone does, but disproportionately women and mothers which naturally leads to the question: at what cost?

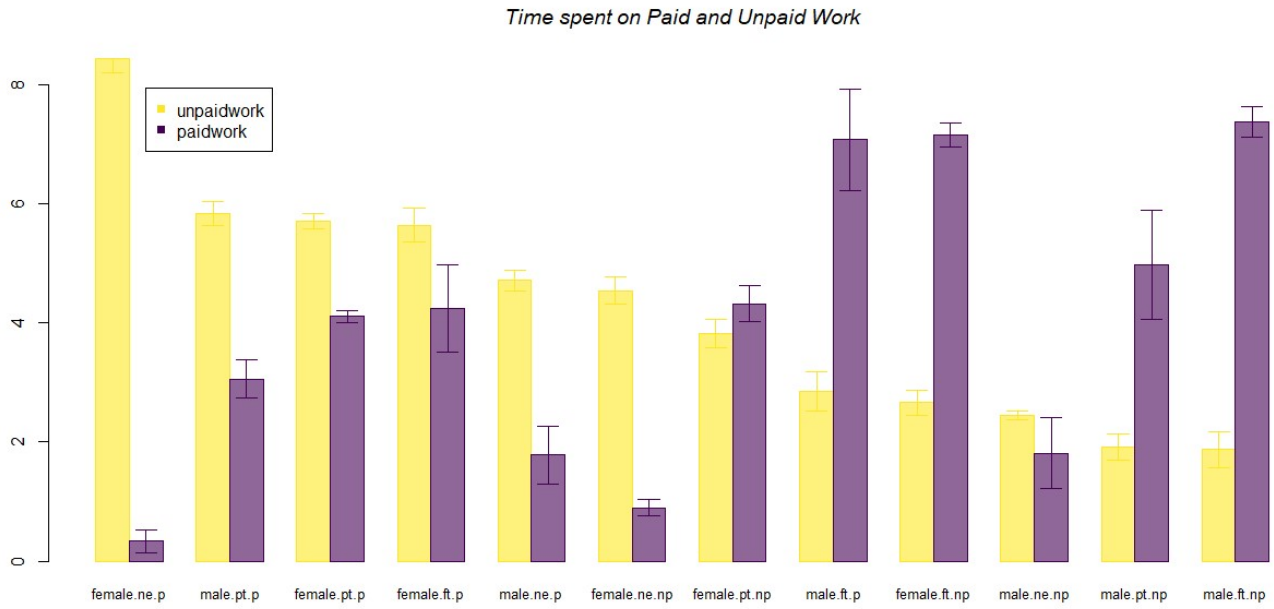

Figure 8. Time spent on paid and unpaid work by individuals aged 18-60 sorted by employment status, family status and gender
Source: Time Use Survey 2008/09 Statistics Austria

Methodology and Model Specification

Evaluating how socioeconomic characteristics affect time spent on unpaid work and labour market outcomes, respectively, requires an ordered approach, i.e. regression analyses. Due to the broad definition of unpaid work and the multitude of factors influencing labour market participation decisions, however, I cannot definitely claim causality for any effects or correlations I find.[10] Nonetheless, the conjunction of statistically significant estimates and economic intuition has the potential and is thus the

[10] Labour economics naturally has many intersections with other social sciences which often point to unobservable characteristics. Therefore, handling the matter of causality is a recurring problem for (labour) economists. See, for example, Fortin who writes: "A difficult question is the issue of causality. Despite efforts to address this issue, many of the results below should be more precisely referred to as partial correlations, rather than causal factors. At times I use the word 'impact' or 'effect' of attitudes and values to simplify the exposition, but the reader should feel free to interpret this as mere correlation." (2005)

basis of providing valuable insights into the economics of unpaid labour as well as useful policy implications.

In order to explore how time spent on unpaid work is affected differently compared to labour market participation rates, it is crucial to account for factors that are known to influence time spent on the paid labour market. To avoid introducing an omitted variable bias to the model, I follow various papers concerned with the drivers of female labour force participation rates and account for their findings in the form of my explanatory variables. Based on the availability of data and the compatibility of the independent variables, I create and estimate a fairly simple logit model which has either involvement in unpaid work or labour market participation on the left-hand side as can be seen in equation (1)[11].

$$\ln\left[\frac{P(ls_i = 1)}{1 - P(ls_i = 1)}\right] = X_i\beta + \varepsilon_i \qquad (1)$$

The equation's dependent variable captures individual i's labour supply (*ls*), both paid and unpaid, or to be precise the logarithm of the odds thereof. I thus effectively estimate a model with the probability of being employed against the probability of not being in employment[12] and a model with the odds of spending some time on unpaid work as opposed to none at all. In a first step, I estimate how factors such as age, parenthood and education among others affect the binary outcome variables of paid labour market participation and involvement in unpaid labour activities and analyse any relevant differences. I further differentiate between two forms of unpaid work, household work and care work, to account for individual heterogeneity. In a second step, I investigate the intensive margin of paid and unpaid labour supply by allowing the dependent variable to be continuous, i.e. hours spent on paid and unpaid labour.

$$worktime_i = X_i\beta + \varepsilon_i \qquad (2)$$

[11] In creating and interpreting the model, I make use of and follow Hosmer and Lemeshow's comprehensive textbook "Applied Logistic Regression" (2013).
[12] i.e. the odds to be employed

By comparing the estimates, I try to evaluate how socioeconomic characteristics interact with the intensive margin of both the paid and unpaid labour market.

In order to further illustrate how the explanatory variables influence various subgroups in different ways, I estimate my models for men and women aged 18-60, respectively (roughly 2,500 male and 3,000 female individuals) and then limit the sample to include only childless women (1,400) as opposed to mothers (1,600). The right-hand side comprises individual characteristics subsumed in X as well as the error term ε. Whereas the descriptive exploration of the data facilitates showcasing the status quo, the regression analysis offers some indication of how to influence the current situation based on significant dependencies.

To minimise the bias introduced in the process of the model selection, I make use of the magnitude of economic literature addressing labour market participation decisions. I collect the various explanatory variables used and from this pool select my variables. Naturally, I have to discard some variables such as income (Boelmann et al., 2021), work experience or health status (Matteazzi et al., 2018) due to a lack of data. Others, such as household size and number of children of different age groups would lead to multicollinearity issues when used together or a too-reduced subsample size. Most closely following the approaches of Alonso et al. (2019), Jessen (2022), and Riederer and Berghammer (2020) among others, I thus arrive at the following explanatory variables which I further amend by adding squared and interaction terms:

partner, a dummy indicating whether an individual lives together with a partner

parent, a dummy indicating whether an individual lives together with children of their own (including adopted children)

nchild06, the number of children between the ages of 0 and 6 living in the same household

nchild615, the number of children between the ages of 6 and 15 living in the same household

age in years (limited to 18-60)

education dummies with the baseline being compulsory schooling: *mabe*, indicating whether an individual has completed high school or professional training; *maube*, indicating whether an individual has completed high school *and* professional training and

stmei, indicating whether an individual has completed any university degree or is a master craftsman[13]

city, a dummy indicating whether an individual lives in a city with more than 100,000 residents (1) or not (0)

migbg, a dummy indicating whether an individual either does not have an Austrian citizenship or was not born in Austria (1)

Concerning the intensive margin of labour supply, the number of observations decreases strongly as I exclude individuals who are neither working in nor outside the household from the estimation. For the paid labour market, I am left with roughly 2,150 male and 2,250 female individuals. With respect to unpaid labour, the decrease in sample size depends on the form of unpaid work as more individuals have to spend at least some time on *hhwork* (4,600) than on care work (1,700). Due to the decrease in sample size and the availability of additional information on individuals active in the paid labour market, the regressors change slightly to further include:

bighh, a dummy indicating whether an individual lives in a big household, i.e. in a household with more than three household members

occupation-dummies, following the classification code of the International Labour Organization, ISCO-88, with the baseline being employment in elementary occupations[14]; the remaining dummy-variables are: *manager* indicating employment as legislators, senior officials and managers; *scient* indicating employment as professionals; *techn* indicating employment as technicians and associate professionals; *clerk*; *servsale* indicating employment as service workers and shop and market sales workers; *agri* indicating employment as skilled agricultural and fishery workers; *craft* indicating employment as craft and related trades workers and *machine* indicating employment as plant and machine operators and assemblers (ILO, 2004)

industry dummies with the baseline being the service sector: *farm*, indicating whether an individual works in the agricultural sector and *ind*, indicating whether an individual works in the industrial sector

[13] I exclude education levels below compulsory schooling as the subsample size would be too small to be representative. For the same reason, having completed a PhD is merged with *stmei*.

[14] Similar to the education dummies, I have to exclude a subgroup, in this case, individuals working in the army because of too few observations.

Concerning the inclusion of squared and interaction terms, I consult the exponentiated estimates of the odds ratios specification instead of the average marginal effects (AME) that I will report in the next chapter. I do so because the AME's are point estimates describing the slope of a single regressor. Simply put, they are calculated as the partial derivation of one explanatory variable. This process, however, makes it difficult to extrapolate the gain of including interaction terms. Therefore, the odd ratios are used to retrace interaction effects[15] (Leeper, 2017). Moreover, making use of marginal model plots, I find that for model specifications concerning labour market participation, *age* most likely does not have a linear but rather a quadratic relation with the dependent variable.

Table 1 subsumes the regressors' sample averages scaled with individual weights. Columns (1) and (2) concern all male and female individuals aged 18-60 whereas column (3) captures only those active in the paid labour market and columns (4) and (5) regard men and women spending some positive amount of time on household and care work respectively. Interestingly, individuals spending some time on unpaid labour feature above-average labour market participation (*lmp*) rates. However, those spending a positive amount of time on care work also have the lowest fulltime rate which coincides with the fact that of roughly 1,700 care workers 1,100 are female. Albeit the gender ratio of individuals involved in household work is similar (with 2,800 of 4,600 being women), their fulltime rate is closer to the population average which yet again confirms that part-time work arrangements are oftentimes the result of care responsibilities. Naturally, care work further relates to higher amounts of time spent on *hhwork* and a higher share of parents. Concerning columns (1) and (2), the contrast between men and women in labour supply is quite prominent, as is time spent on unpaid domestic and care work. The absence of any other strong differences between men and women suggests that unpaid work might indeed be one of the missing links in analyses addressing the gender imbalance on the paid labour market.

[15] Even though their informative value to interpret the final results is limited.

Table 1
Characteristics of Men and Women aged 18-60
Source: Time Use Survey 2008/09 Statistics Austria

	all Individuals		Individuals active in the paid/unpaid labour force		
	Men (1)	Women (2)	Paid Labour (3)	Household Work (4)	Care Work (5)
Work					
lmp	0.877	0.757	1.000	0.805	0.820
fulltime	0.787	0.394	0.750	0.719	0.633
hhwork	1.846	3.774	2.557	3.337	3.375
childcwork	0.437	0.998	0.677	0.773	2.280
cwork	0.026	0.055	0.030	0.043	0.129
volun	0.234	0.194	0.200	0.202	0.198
Individual Characteristcs					
partner	0.644	0.651	0.666	0.662	0.870
parent	0.462	0.532	0.521	0.512	0.890
nchild06	0.261	0.264	0.264	0.264	0.758
nchild615	0.303	0.335	0.336	0.327	0.659
age	39.194	39.240	39.054	39.778	37.500
educ	2.401	2.247	2.406	2.326	2.499
city	0.275	0.293	0.275	0.291	0.254
migbg	0.155	0.191	0.172	0.176	0.236
Observations	2,463	2,986	4,412	4,627	1,717

Notes: Characteristics of individuals aged 18-60 by gender, and characteristics of individuals aged 18-60 spending at least some amount of time on paid labour, household work or care work

In order to gain a deeper understanding of the dependencies and correlation of paid and unpaid work, I further include a third model specification. In addition to the equations described above, I opt for the unconventional inclusion of *uwork* in the logit regression having labour market participation as the dependent variable. It is crucial to keep in mind, however, that there are certain difficulties to this approach stifling the estimates' explanatory power: Clearly, *lmp* and *uwork* share the same space, that is the 24 hours of available time per day. Since this connection naturally leads to a fairly high correlation, the effects found in a regression analysis might overstate *uwork's* significance in the

matter. Moreover, since time spent on unpaid labour is mostly considered a choice variable, it might not be sufficiently exogeneous[16]. Both of these issues could and most likely do lead to biases due to endogeneity. However, since with the exception of age and birthplace, almost no explanatory variable is ever truly exogenous, I try to challenge and recalibrate the balance point of which factors to sensibly include in a model dealing with labour supply, specifically with female labour supply. I do so by trying to circumvent the aforementioned issue of endogeneity.

First of all, I deconstruct *uwork* into household work and care work (i.e. *cwork* together with *childcwork*), both of which constitute tasks that simply need to be done and are costly to outsource[17]. Similar to choices regarding education, the decisions to commit to children or dependent adults either happened in the past or were not voluntary in the first place. Hence, the exogeneity argument for care work can be constructed in a similar fashion to the justification of the inclusion of education parameters[18]. Therefore, the choice component lies mostly in *who* spends their time on these activities. However, the prevalence of women in care and household work positions throughout the last decades, through all levels of education, age etc. begs the question of whether households are faced with a personal decision or whether they simply assume a societal habit.

Secondly, several robustness tests show that including any aspect of unpaid work in the regression equation does not skew the other estimates. I conduct these robustness checks by leaving out the unconventional regressors *hhwork, childcwork, cwork* and *volun*. Ideally, the other estimates should not drastically change which is the case for all model specifications, suggesting that the models are robust concerning the newly added regressors. Given that the AIC is lower, Pseudo-R^2's are higher, and the estimates are

[16] However unconventional, I am not the first to combine measures for paid and unpaid work in a regression as e.g. Alonso et al. use employment status to estimate time spent on paid and unpaid work respectively (2019).

[17] Availability of subsidised facilities varies and if there are none available, caretakers incur costs both in terms of money and time as organising private alternatives might be difficult. The hindered possibility of self-determination due to the difficulty of balancing work and care responsibilities is pointed out by an OECD publication on persisting gender gaps: "If high childcare costs mean that it is not economically worthwhile for women to work full-time; if workplace culture penalises women for interrupting their careers to have children; and if women continue to bear the burden of unpaid household chores, childcare and looking after ageing parents, it will be difficult for them to realise their full potential in paid work." (OECD, 2012)

[18] What is more, former research has successfully used time spent on care work in a comparable setting (see e.g.: Leigh, 2009; Spieß and Schneider, 2003).

statistically significant, the inclusion of time spent on unpaid labour might thus just be sensible.

Methodologically speaking, questioning the plausibility of various explanatory variables' exogeneity has the potential to benefit the development and growth of the overlapping field of economics and sociology and the bridges between the two. More importantly, in terms of economic content, facilitating and provoking thought on unpaid labour markets – their economic and social costs, their interaction with the paid labour market, the (in)visibility and valuation of labour – has been for quite some time and still is a vital part of understanding (female) labour market participation as well as decisions made concerning part-time or fulltime employment. Therefore, I propose this approach as I believe that it is a first step in the direction of (re)discovering the role of unpaid domestic and care work in the economic context of labour supply.

Results

Extensive Margin – Who cares, who works?

As can be seen in Table 2, there are some noteworthy differences between men and women when observing the influencing factors for paid labour market participation and involvement in unpaid domestic and care work.

Firstly, I tackle the question of which factors affect male and female *lmp* (see columns (1) and (2)): The estimation of the logistic model points towards various characteristics that are well known to influence who enters the paid labour market. Interestingly, most of the parameters affecting *lmp* differ between males and females both in terms of significance as well as magnitude[19]. Similar to previous research, I find that sharing a household with a partner, for example, plays a significant role for men, increasing the probability of spending at least some time on the paid labour market on average by almost 7 percentage

[19] These differences are also pointed out by many other researchers such as Alonso et al. (2019) and Fortin (2005) but quite a few economists concerned with labour supply and gender gaps mainly focus on female and maternal labour supply in the first place (e.g. Boelmann et al., 2021; Riederer and Berghammer, 2020 among others).

points (p.p.), while it does not appear to affect women's decision to participate in the paid labour market at all (Fortin, 2005). The number of children, on the other hand, has a pronounced negative effect on women's *lmp* whereas the presence of kids does not seem to influence the extensive margin of male labour supply[20]. *Parent* is insignificant in both specifications which is most likely due to the fact that smaller children, captured by the number of children aged 0-6 and 6-15 respectively, account for most of the parenthood penalty. The drastic difference between the estimate for *nchild06* in the male model specification, whose p-value is quite far above any significance level, and the estimate of the female-focussed specification, which lies at -16.2 p.p., supports existing literature in pointing to a motherhood instead of a parenthood penalty (see Kleven et al., 2019; Jessen, 2022). Further inspection also shows that not only *parent* as well as *nchild06* but also *nchild615* is insignificant for men. Since all three parameters, *parent, nchild06* and *nchild615*, are included in the regression estimation, there is some risk of an elevated variance inflation factor. However, for all model specifications and all estimates it stays well below 5, clearing any concerns for multicollinearity. Unsurprisingly and matching existing literature, *age* has a small negative yet significant effect on women's *lmp* whereas education has a very strong positive effect – the higher the education, the larger the effect and even more so for women than for men (e.g. Fortin, 2005). Living in a city seems to negatively affect *lmp* of both men and women. However, even though causality cannot be claimed for any findings, one interpretation might be that the relation between *lmp* and *city* runs the other way around, that is, labour market participation might generally be lower in cities for different reasons (Statistics Austria, 2024b).

Focussing on *hhwork* (columns (3) and (4)), it becomes clear that pinning down explanatory variables for involvement in household chores is quite difficult. In fact, only age seems to have a small positive effect on both male and female participation. Men are additionally roughly 7 p.p. more likely to partake in domestic unpaid work when they live in the city which might have to do with gender stereotypes and their prevalence in rural compared to urban spaces (see also Kleven, 2022). Notably, when estimating a logit

[20] While the negative effect of motherhood on women's paid labour market participation is well-documented (e.g. Riederer and Berghammer, 2020; Jessen, 2022 etc.), the impact of parenthood on male labour supply is not equally clear. Alonso et al. find that fatherhood generally leads to an increase in hours spent on the paid labour market but this effect is offset by an increase in number of children (2019).

model around *hhwork* with all individuals aged 18-60, *female* has a large significant effect of roughly 22 p.p. Given the lack of further significant estimates and the absence of differences in male and female baseline characteristics, the results hint at the possibility that the workload of unpaid household labour somewhat arbitrarily falls to women.

Lastly, columns (5) and (6) feature the average marginal effects on the probability of spending at least some amount of time on care work. Naturally, the largest effects relate to household composition and family status. Therefore, *partner* has a small effect of almost 4 p.p. on women's involvement in care work and *parent*, *nchild06* as well as *nchild615* influence both male and female participation in care work. It should be noted, however, that the number of children increases women's probability to partake in care work much more strongly than men's (see also Jessen, 2022 and Alonso et al., 2019).

Contrary to previous studies, additionally including partners' time spent on paid (*ppaid*) and unpaid labour (*punpaid*) as well as their education level (*peduc*) does not do much for the regression analysis. First of all, it restricts the sample size as information on partners is limited. Secondly, the estimates for both *peduc* and *ppaid* are insignificant for all specifications, solely *punpaid* has a tiny negative effect on women's probability of being involved in household and care work. Similarly, the model specifications focussing on mothers and childless women respectively, do not yield any more insights than the analyses discussed above both due to relatively small sample sizes and the lack of variability in the data (See Table A.2 for partner-specifications, and Tables A.3 and A.4 for regression results for childless women and mothers).

These estimations aim to illustrate the connection between the extensive margin of paid and unpaid labour supply which somewhat surprisingly is not quite as intuitive as it might seem. The fact that most of the workload of unpaid labour rests on female shoulders cannot clearly be explained by my analyses' explanatory variables. However, there seems to be a definite connection between care work and paid labour through the presence and number of children pointing to the plain yet important finding that the motherhood penalty does not only apply to paid but to unpaid labour as well in the sense that children not only decrease mother's time spent on paid labour but also bind them to the unpaid labour market.

Table 2

Results: Extensive Margin by Gender

Source: Time Use Survey 2008/09 Statistics Austria

	Lmp				Hhwork				Care			
	Male (1)		Female (2)		Male (3)		Female (4)		Male (5)		Female (6)	
	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value
partner	**0.067**	<0.001	-0.005	0.834	0.023	0.483	0.027	0.135	0.044	0.165	**0.037**	0.028
parent	-0.011	0.609	0.001	0.970	-0.054	0.157	0.033	0.127	**0.126**	<0.001	**0.083**	<0.001
nchild06	0.027	0.364	**-0.162**	<0.001	-0.022	0.694	0.022	0.203	**0.212**	<0.001	**0.442**	<0.001
nchild615	-0.002	0.921	**-0.071**	<0.001	0.003	0.878	0.014	0.290	**0.074**	<0.001	**0.163**	<0.001
age	-0.001	0.568	**-0.006**	<0.001	**0.004**	0.013	**0.003**	<0.001	-0.001	0.410	**0.002**	0.070
mabe	0.024	0.231	**0.094**	0.001	-0.011	0.738	0.020	0.191	0.006	0.835	0.000	0.982
maube	0.011	0.717	**0.113**	0.002	0.022	0.653	0.007	0.709	0.061	0.113	0.008	0.770
stmei	**0.102**	0.004	**0.251**	<0.001	0.027	0.539	-0.017	0.440	0.042	0.184	0.021	0.532
city	**-0.037**	0.044	**-0.056**	0.076	**0.072**	0.059	-0.004	0.750	-0.017	0.518	-0.034	0.102
migbg	0.000	0.990	-0.035	0.374	-0.008	0.856	-0.022	0.243	0.027	0.395	-0.045	0.111
Observations	2,463		2,986		2,463		2,986		2,463		2,986	

Notes: Regression results of estimating male and female paid and unpaid labour market participation for individuals aged 18-60

Intensive Margin – Stuck in a Pattern?

The following subchapter addresses the question of which factors determine the intensive margin of labour supply. Its purpose thus is to point out which characteristics affect how much time is spent on paid and unpaid labour. A comparison of the estimates is only possible to a limited degree as the subgroups are different from one another. Column (1) of Table 3 concerns those active on the paid labour market whereas columns (2) and (3) analyse the intensive margin of unpaid labour supply categorised as before into household and care work. I firstly estimate the effects of individual characteristics as well as occupation on hours spent on paid and unpaid work for all individuals active in the respective labour market (see Table 3). In a second step, I differentiate between male and female labour supply, leaving out occupation and instead making use of information on the economic sector (see Table 4). The distinction between the two specifications yet again has to do with sample sizes. As I make use of the classification code ISCO-88, which differentiates between 10 types of occupation, applying all these types to the subsamples of men and women who are active in the paid and unpaid labour market would splinter the observations into groups too small to sensibly estimate any effects. Furthermore, it should be kept in mind as a preliminary note that the low part-time rates among both childless men and fathers lead to low variability in the average hours spent on the paid labour market. The results listed in Table 4 thus have to be interpreted cautiously. Methodologically, the analysis of the intensive margin uses slightly different explanatory variables than those used in the previous specifications. Instead of the number of children (*nchild06* and *nchild615*), I use dummies capturing whether any children aged 0-6, 6-15 or 15-27 are present in the household. In doing so, the subsamples used to estimate the regressors are enlarged, allowing for clearer insights. To further incorporate the potential effect of a large number of children or other household members, the dummy-variable *bighh* is introduced recording whether a household has more than three members.

Independent of whether analysing the paid or unpaid labour market, occupation plays an important role. With elementary occupations as reference group, the large effects of *agri, manager* and *craft* at one to three and a half additional hours of paid working time are glaring. Coincidentally, the share of men in these jobs lies at 72% for *manager*, 56% for *agri* and 93% for *craft*. Almost 75% of all women in employment, on the other hand, work

as technicians, clerks, service personnel or in elementary occupations and working mothers are most likely found in the service sector (about 80%)[21]. The most promising explanation behind this feature of the data has to do with the aforementioned phenomenon of occupational segregation which has been found to affect gender imbalance on the (paid) labour market (Kreimer, 2004)[22]. Concerning unpaid domestic and care work, the analysis of occupation would call for a second sample restriction such that only those are included who are both active in *and* outside the household. Limiting the subgroups in this way does indeed produce similar results for the varying occupations, that is most occupations negatively affect time spent on unpaid work compared to elementary occupations (see Table A.5). However, Tables 3 and 4 illustrate the estimates for model equations with a single restriction only, namely actively partaking in unpaid domestic or care work respectively in order to guarantee workable sample sizes. Therefore, occupation or sector is no sensible addition to the model describing the intensive margin of unpaid labour as the baseline would no longer be elementary occupations but rather no current employment.

As expected, *female* has a strong effect on all three specifications. Employed women seem to spend on average almost one and a half hours less on the paid labour market than their male counterparts but this effect is reversed when considering domestic and care work. Regarding relative magnitude, *hhwork* stands out as being a woman increases the average time spent on chores by 1.4 hours which is almost four times as large as the intercept at roughly 20 minutes. Contrary to what I find along the extensive margin, *partner* seems only to be positively affecting time spent on household work rather than care or paid labour. Moreover, the role of children also appears to be different on the intensive margin as there is no statistically significant effect on paid labour supply[23] but a positive effect of both the presence of children and *bighh* on the supply of *hhwork* and *care*.

[21] Calculated on the basis of the 2008/09 TUS using individual weights.

[22] The prevalence of part-time arrangements of Austrian mothers is supported by the estimates for the model concerned with maternal labour supply as the results suggest that both *farm* (= having a job in agriculture and forestry) and *ind* (= having a job in commerce and industry) significantly and positively affect mothers' probability to work fulltime compared to the baseline of working in the service sector (*serv*) – though it is the sector where most working mothers are employed in.

[23] Yet, it is important to note that this is mostly due to the opposing effects of the sexes as will be discussed in the next section.

Table 3

Results: Intensive Margin

Source: Time Use Survey 2008/09 Statistics Austria

	Paid Labour Supply (1)		Hhwork Supply (2)		Care Supply (3)	
	AME	p-value	AME	p-value	AME	p-value
Intercept	**6.999**	<0.001	**0.376**	0.034	**1.568**	<0.001
Occupation						
manager	**2.529**	<0.001	-	-	-	-
scient	0.656	0.315	-	-	-	-
techn	0.708	0.171	-	-	-	-
clerk	0.154	0.776	-	-	-	-
servsale	**0.941**	0.074	-	-	-	-
agri	**3.549**	<0.001	-	-	-	-
craft	**1.02**	0.076	-	-	-	-
machine	0.813	0.224	-	-	-	-
Individual Characteristics						
female	**-1.428**	<0.001	**1.430**	<0.001	**1.170**	<0.001
partner	-0.078	0.799	**0.461**	<0.001	0.078	0.575
child06	-0.315	0.391	**0.220**	0.037	**0.787**	<0.001
child615	-0.174	0.614	0.082	0.401	**-0.675**	<0.001
child1527	0.049	0.892	**0.215**	0.031	**-0.770**	<0.001
bighh	-0.048	0.888	**0.249**	0.011	**0.734**	<0.001
age	0.019	0.149	**0.055**	<0.001	**-0.016**	0.005
mabe	0.265	0.526	**-0.418**	<0.001	-0.026	0.848
maube	-0.066	0.906	**-0.366**	0.008	-0.061	0.736
stmei	0.325	0.553	**-1.007**	<0.001	**0.584**	<0.001
city	0.392	0.196	**-0.138**	0.089	**0.437**	<0.001
migbg	**-0.857**	0.018	-0.074	0.448	0.178	0.107
Observations	4,293		4,614		1,712	

Notes: Regression results of estimating how many hours individuals aged 18-60 spend on paid work, household and care work; occupations only apply to paid work since individuals spending time on *uwork* are not necessarily employed

Importantly, though, only the presence of young children leads to an increase in time spent on care work while children aged 6 and older tend to decrease the average time spent on unpaid care work. The estimate for the effect of age on time spent on paid and unpaid labour is positive, yet small when it comes to *hhwork* at around 3 minutes for every additional year and even smaller but negative when care work is concerned. The latter might have to do with the fact that of all individuals spending time on care work most are taking care of children who naturally grow less dependent as they age which potentially explains the negative effect of age. Surprisingly, education appears to be insignificant for paid labour supply which seems counterintuitive. However, literature and data suggest that there are two reasons for this. First of all, occupation and education are highly correlated. Thus, leaving the occupation dummies out of the regression analysis should somewhat change the results which is indeed the case as the highest level of education becomes relevant. Secondly, decisions on how much time to spend on the paid labour market are, at least to some degree, affected by financial reasoning, i.e. by the question of whether one can afford not to work fulltime – both in terms of absolute household income and opportunity costs in the form of forgone income. Therefore, studies suggest that population groups with either low or fairly high levels of education have low *pt*-rates whereas those with some formal education have the highest levels of part-time working individuals (Sturn, 2023). The report further points to the influential role of occupation and sector which I also find in the data as discussed above. Education above compulsory schooling does, however, affect time spent on *hhwork* and quite strongly so. Having completed high school or professional training decreases time spent on chores on average by 25 minutes and having completed both leads to an additional decrease of roughly 22 minutes. A university degree or being a master craftsman decreases *hhwork* supply even further by about an hour. Interstingly, *stmei* has the opposite effect on the intensive margin of care work supply, increasing the average time spent on care by 35 minutes. A possible explanation is that spending time with one's children might affect utility levels more positively than cleaning and cooking, thus rendering *care* more desirable than *hhwork*. Individuals with higher education, and likely higher income, therefore choose to outsource *hhwork* but to increase time spent on *care*. However, the overall effect of education on unpaid work seems to be negative which aligns with the role of schooling found in existing literature (e.g. Alonso et al., 2019).

In order to showcase how individual characteristics affect male and female labour supply differently, a differentiation between the sexes is made for the results shown in Table 4 allowing for additional insights such as the fact that it is women who are carrying the positive effect of *partner* on *hhwork* supply (see also Alonso et al., 2019). Possibly, this observation has to do with cultural norms prescribing household labour as women's work. Therefore, once a couple shares a household, women's time spent on chores increases whereas men's stays constant or decreases. Most important, however, are the differences found concerning paid labour supply. First of all, the role of children is highly significant for women as having young children present in the household strongly decreases female paid labour supply. Whereas older children have less of an observable effect on the intensive margin of paid labour market participation compared to younger ones, the presence of children aged 6 to 15 has the most distinct negative effect on decisions on paid labour supply with estimates of about -1.5 and -1.3 hours, respectively. While it might be curious at first glance that the effect is almost equally large for very young children and those at compulsory schooling age, this finding is consistent with existing literature pointing to the fact that part-time decisions often seem to be a long-term arrangement, especially in Austria (Jaumotte, 2004; Riederer and Berghammer, 2020). Concerning the male side of things, the presence of children aged 6 to 15 positively affects male paid labour supply which might relate to the male breadwinner model. Furthermore, both sector and education influence how much time is spent on the paid labour market, albeit the latter only appears to matter for women. However, this might be due to the aforementioned low variability in data for men[24]. The baseline difference of time spent on paid and unpaid labour captured by *female* before is now more precisely made visible through the difference between the intercepts. All things considered, what has already been observable in the descriptive analysis of the data, has now been conclusively shown. Namely, there is an undeniable gender imbalance – both on the paid and the unpaid market, and the two are most likely tightly interwoven.

[24] Of all men spending at least some amount of time on the paid labour market, the first to the eighth decile of working hours strays on average only one and a half weekly hours from the mean which lies at 40 hours per week.

Table 4

Results: Intensive Margin by Gender

Source: Time Use Survey 2008/09 Statistics Austria

	Paid Labour Supply				Hhwork Supply				Care Supply			
	Male (1)		Female (2)		Male (3)		Female (4)		Male (5)		Female (6)	
	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value
Intercept	**7.479**	<0.001	**6.428**	<0.001	**0.879**	0.001	**1.044**	<0.001	**1.409**	0.002	**2.972**	<0.001
partner	0.395	0.303	-0.584	0.214	0.034	0.803	**0.795**	<0.001	**0.452**	0.098	0.023	0.888
child06	0.295	0.490	**-1.477**	0.015	-0.056	0.742	**0.545**	<0.001	0.107	0.528	**1.162**	<0.001
child615	**0.889**	0.033	**-1.305**	0.018	**-0.365**	0.027	**0.434**	<0.001	**-0.584**	<0.001	**-0.695**	<0.001
child1527	-0.184	0.659	0.279	0.628	-0.125	0.443	**0.462**	<0.001	**-0.504**	0.014	**-0.994**	<0.001
bighh	-0.112	0.779	-0.308	0.582	**0.433**	0.009	0.174	0.151	**0.703**	<0.001	**0.668**	<0.001
age	0.022	0.157	0.005	0.798	**0.044**	<0.001	**0.066**	<0.001	-0.004	0.662	**-0.025**	0.001
mabe	-0.146	0.780	**1.026**	0.093	-0.118	0.519	**-0.475**	<0.001	**-0.441**	0.075	0.047	0.773
maube	-0.251	0.710	0.584	0.463	-0.213	0.376	**-0.331**	0.048	**-1.036**	<0.001	0.255	0.255
stmei	-0.109	0.851	**1.583**	0.030	**-0.376**	0.073	**-1.330**	<0.001	0.045	0.863	**0.697**	<0.001
city	-0.203	0.581	**1.064**	0.028	-0.116	0.369	-0.125	0.228	**0.765**	<0.001	**0.240**	0.092
migbg	**-0.991**	0.019	-0.657	0.246	0.160	0.321	**-0.272**	0.024	**0.367**	0.025	-0.010	0.947
farm	**3.268**	<0.001	**4.797**	<0.001	-	-	-	-	-	-	-	-
ind	0.347	0.273	**1.071**	0.093	-	-	-	-	-	-	-	-
Observations	2,103		2,190		1,787		2,827		594		1,118	

Notes: Regression results of estimating how many hours men and women aged 18-60 spend on paid work, household work and care work; sectors only apply to paid work since individuals spending time on *uwork* are not necessarily employed

Gender Gap in *lmp* – How much can *uwork* explain?

The connection between time spent on paid and unpaid work and how it affects gender differences has been analysed and studied by Alonso et al. They investigate the effect of employment status and unsurprisingly find significant effects on both paid and unpaid labour that are generally much larger for women than for men (2019). Since I find the feedback effect between male *lmp* and *uwork* to be rather strong, I limit unpaid work to household and care work and restrict my sample to women/mothers. With these restrictions in place, I find some significant indications that support their findings.

In both specifications, unpaid domestic and care work appears to decrease the probability to participate in the paid labour market. Albeit the estimates are rather small, it is important to keep in mind that the unit of measurement is 15-minute slots. Therefore, an hour spent on household work lowers *lmp* on average by 2.8 and 3.2 p.p. when modelling women's and mothers' *lmp*, respectively. Effectively, this finding can be interpreted as suggestive evidence pointing towards the interpretation that women's labour market participation is significantly affected by time spent on unpaid labour. Moreover, it should be noted that multiplying the average marginal effect to arrive at these numbers is a simplification as there is evidence that higher levels of time spent on unpaid labour yield larger *lmp*-penalties (see Figure 9). Since a direct comparison with male *lmp* is not possible, how much of the gender gap can be explained by time spent on unpaid work is difficult to assess. Nonetheless, the fact that the majority of unpaid labour is born by women indicates that the explanatory power and gravity of *uwork* is possibly quite large.

The slight difference in the effects on mothers and women, in general, might indicate that especially care and childcare work seem to affect mothers differently than the rest of the female population, although the different sample sizes cause limited comparability. Naturally, attempts to explain why this is the case can only be speculative but one possible explanation might be that (young) mothers already spent time out of the paid labour market because of parental leave. Thus, if additional care responsibilities arise, due to their relatively lower income and other labour market barriers, they might choose to forgo their income and rather spend more time on unpaid care work; which would in turn lead to a larger estimate for *cwork* in the maternal *lmp*-model than for the other

specification, i.e. care work affecting mothers more than childless women. However, the analysis of total time spent on unpaid labour is of utmost importance as cleaning, cooking, doing the laundry etc., i.e. household work accounts for the largest proportion of unpaid work in terms of the average time spent on the various forms of unpaid labour and thus potentially has the largest absolute impact on *lmp*.

Table 5
Results: Female and Maternal Labour Market Participation
Source: Time Use Survey 2008/09 Statistics Austria

	Women		Mothers	
	AME	p-value	AME	p-value
Unpaid Work				
hhwork	**-0.007**	<0.001	**-0.008**	<0.001
carework	**-0.005**	0.001	**-0.007**	<0.001
Individual Characteristics				
partner	0.019	0.401	-0.045	0.235
parent	0.042	0.146	-	-
nchild06	**-0.112**	<0.001	**-0.129**	<0.001
nchild615	**-0.056**	0.002	**-0.049**	0.019
age	**-0.004**	0.003	**-0.007**	0.003
mabe	**0.085**	0.002	**0.121**	0.001
maube	**0.104**	0.004	**0.172**	<0.001
stmei	**0.214**	<0.001	**0.280**	<0.001
city	**-0.060**	0.050	-0.062	0.202
migbg	-0.051	0.177	-0.044	0.318
Observations	2,986		1,602	

Notes: Regression results of estimating female and maternal paid labour market participation for individuals aged 18-60

As mentioned above and can be seen in Figure 9, the marginal effect of unpaid work varies with different levels thereof. Generally speaking, the more time is spent on unpaid work, the stronger the effect on *lmp*. It should further be noted that the estimates for maternal *lmp* are on a lower level than for female *lmp* (see also Table 2). Even though, for both

models, the estimate's lower bound seems to be higher for those spending the most time on unpaid work, it is important to keep in mind that the number of observations for these individuals is quite low. These observations are thus treated as outliers. Furthermore, there is no definite indication that the estimate levels are higher for those than for people spending a bit less time as the standard errors are fairly large and thus still allow for the possibility of an overall downward trend. Overall, it is clearly visible that more time spent on unpaid work decreases the likelihood of participating in the paid labour market drastically and this is true for both specifications.

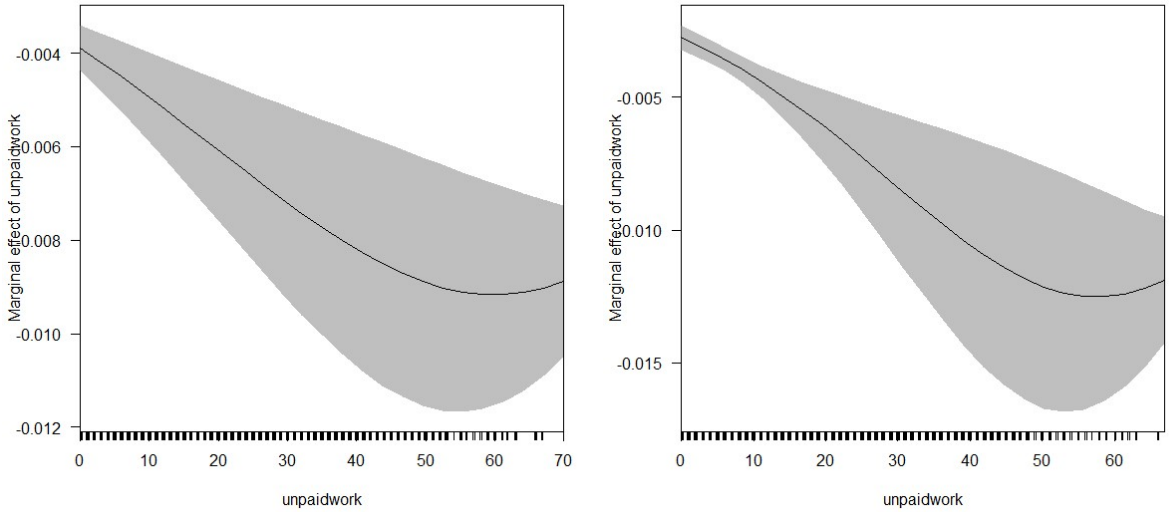

Figure 9. predicted value of the effect of uwork on female (left) and maternal (right) lmp across levels of uwork
Source: Time Use Survey 2008/09 Statistics Austria

Robustness

All logit specifications are estimated with model-robust standard errors (Lumley, 2017). Apart from making sure to use the "sandwich-style" standard errors to avoid misinterpretation of the data, I further conduct robustness tests regarding the analyses' content. First of all, to ensure that the model specification is, in fact, plausible, observing the variance inflation factor (vif), together with various measurements for the goodness of fit such as the pseudo-R-squared, the adjusted R-squared, the Akaike Information Criterion (AIC) and the misclassification error rate[25] is a sensible step. Despite some

[25] As this thesis does not focus on predicting labour supply, the latter serves as supplementary measure only following the suggestions on assessing a model's goodness of fit by Hosmer and Lemeshow (2013).

overlap in a couple of variables (kids, *parent*, *bighh*, *childcwork* etc.), the vif does not pose any issues as it remains below 5. Since the R-squared measures and the AIC as well as the misclassification error rate are sensible measures only by comparison, they are only used to select the final model specification as mentioned in Chapter 3.

In order to rule out the suspicion of P-hacking, numerous specifications were tested. To find whether the significance of *uwork* is volatile and heavily depends on the model built or whether it is continuously observable, the regression equation was computed with different subpopulations as well as varying combinations of regressors. The results of these robustness tests closely mirror what is presented in this thesis, that is, small but persistently significant negative effects on the extensive margin of female and maternal labour supply.

As mentioned in the previous chapter, I further make sure that the inclusion of *uwork* does not skew the other estimates' effects. I do so by leaving *hhwork* and *carework* out of all specifications and see how and if the estimates for the remaining explanatory variables change (see Tables 2 and 5). Both in terms of direction and magnitude, there is only one notable development. The effect of *nchild06* is much stronger when *carework* is left out of the equation which is very intuitive as *childcwork* most likely captures the better part of the motherhood penalty. Not included in the analysis above is the model specification concerned with all adult individuals due to the endogeneity issues discussed earlier. However, a curious finding when comparing the model with and without *uwork* is that leaving *hhwork* out of the regression equation leads to a substantial shift in the significance of the *female*-estimator. Whereas, the estimate is highly significant, quite large, and negative when unpaid work is left out of the equation, it is much smaller, and in some specifications even insignificant when *hhwork* and *carework* are added[26]. This finding is conspicuous as it gives reason to believe that unpaid labour might indeed be one of the driving forces behind remaining gender inequalities in labour division.

[26] Seeing that *hhwork* makes up the largest share of unpaid labour, only leaving out this specific regressor results in the same effect on the overall regression output.

Conclusion

A crucial aspect of gender equality hinges on financial independence. Therefore, studying and comparing female and male paid labour market participation is of utmost importance. Whereas most economists concerned with labour market outcomes of women focus on parenthood, education or structural differences in sectors of the labour market – and rightfully so – this thesis aims to provide suggestive evidence that the component of unpaid labour might have been overlooked in mainstream economics when tackling questions such as "Why do women choose to work part-time or not to (re-) enter the paid labour market?". An extensive literature review on the role of unpaid work both in economic theory and in empirical findings shows that while overlooked, the component of unpaid domestic and care work is essential not only in the context of labour economics but for the fields of feminist and development economics as well. An in-depth analysis of the status quo in Austria via descriptive exploration of time use data and the estimation of logistic as well as OLS regression models illustrates that women and mothers bear a disproportionate share of unpaid labour. While the male population is in turn responsible for more hours of paid labour, the overall workload is on average larger for women. Furthermore, paid work is, per definition, remunerated and thus generally warrants a higher social and economic status. The regression results indicate that this gendered imbalance is mostly due to differences in the effect of the presence and number of children on paid and care work. Given that previous studies have found the parenthood penalty to actually be a motherhood penalty[27], this finding implies that there is in fact a second side to the motherhood penalty, namely the effect of children on mothers' time spent on unpaid labour. Moreover, I find suggestive evidence that women's probability to partake in the paid labour market is negatively affected by time spent on unpaid labour which is complemented by existing literature that finds time spent on unpaid work to correlate with other significant regressors such as attitudes (Siminski and Yetsenga, 2021; Jessen, 2022), family status (Raley et al., 2021) and choice of occupation/sector (Kreimer, 2004; Lamei and Skina-Tabue, 2011). Nonetheless, it is important to bear in mind that disentangling these effects is rather difficult. However, analysing Austrian TUS data from 2008/09 at least suggests that there is a connection between unpaid labour and

[27] i.e. having children strongly and enduringly negatively affects female labour market outcomes (see Kleven et al., 2019)

the extensive margin of female labour supply which might even have the potential to alleviate the unexplained gender gap in labour division.

Shortcomings and Future Research

As both paid and unpaid labour are to some extent choice variables and further share the same timeframe, endogeneity issues arise when plugging both variables into the same regression. Therefore, I restrict time spent on unpaid work to comprise of solely household and care work and further decrease my sample to include only women. Nonetheless, a richer data set would be of immeasurable value as a longitudinal time use survey would allow for comparisons of individuals before and after having children and how their time use would change. Moreover, income data and information on the availability of childcare facilities as well as attitude markers, e.g. in the form of the European Value Survey (EVS), would be an intriguing and sensible addition to the investigation of female labour supply. Unfortunately, merging these data sources would have gone beyond the scope of this thesis.

Since the underlying moral and psychological implications are plentiful, the intersection of ethics and economics would lend itself to numerous fascinating continuations of this study. How do we want to spend our time? Is it a luxury to want to have a child and spend a lot of time with it, especially in its first couple of years? Or is it a social necessity? Is spending time on paid or unpaid work generally more or less fulfilling and what factors shape these individual preferences? How should work subsequently be divided such that efficiency is maximised? Does efficiency need to include a measurement for "happiness"?

All of these questions, albeit not specifically targeted in this thesis, lie at the core of the issue as unpaid work, especially care work, is situated in an area of conflict. Love cannot be bought but unpaid work being of economic value is undeniable. Ultimately, the question at hand is perfectly subsumed by Folbre who sets against a market-will-fix-it-attitude vs. the notion that the market does in fact not account for everything which is why interventions are needed (see also Folbre, 1995):

> "*Most economists ridicule the utopian socialist vision of a society based entirely on altruism. Is a utopian vision of a family sustained by love alone any more realistic?*" (Folbre, 1994)

Discussion and Policy Implications

Straightforward at first glance, the topic of unpaid work is quite complex as it plays a hidden role in many aspects of gender equality. Therefore, many known remedies might also help to lessen the imbalance in labour division. As the regression results indicate that education plays a significant role and existing literature provides plenty of evidence for the importance of gender norms, information campaigns pointing out the financial and economic harm of conservative attitudes might be fruitful as "exposure to more egalitarian norms can have a lasting effect" (Jessen, 2022). Efforts are made by organisations such as MenCare to promote "men's involvement as equitable, nonviolent fathers and caregivers to achieve family well-being, gender equality, and better health for mothers, fathers, and children" (Equimundo, 2024). It is furthermore known that policies targeted at the provision of childcare facilities are very powerful in fighting gender inequalities as well. They further have the power to influence unpaid labour division too since effectively, workload is shifted away from individual households and is thus turned into wagework, setting incentives to increase time spent on the paid labour market[28]. Approaching from the opposite side of things, higher wages for women would lead to lower incentives to stay at home as the cost of foregone wages would rise. Naturally, the role of laws on taxation and parental leave is in the same line of argumentation as both shift or create (dis-)incentives to divide paid and unpaid labour more or less equally within households. These laws, in turn, have the power to affect attitudes since:

> *"public policy often hinge on underlying values that, in the long run, influence both norms and preferences. How do we, ourselves, value caring labor? How important do we think it is to the full realization of human capacities?"* (Folbre, 1995)

As can be seen, many approaches to tackle gender inequality that have been at the centre of political debate for the last couple of decades also affect unpaid labour as it is intricately interwoven with many of the corresponding issues. An OECD appeal titled "Closing the Gender Gap" subsumes:

> "*good and affordable childcare is a key factor for better gender equality in employment, but change also has to happen at home as the bulk of housework*

[28] "More recent evidence consistently suggests that the two [paid and unpaid care, note] may be partial substitutes, so an increase in formal service provision is associated with fewer hours of care contributed by family members. Similarly, a decrease in formal service provision is associated with an increase in hours of care by family members" (Lilly et al., 2007).

> *and caring is left to women in many countries, and policy can support such change, for example, through parental leave policies that explicitly include fathers*" (OECD, 2012).

Some measures, though, are targeted more specifically at the concern that is the imbalance of gendered labour division. First and foremost, many researchers have made an effort to place weight on the valuation and visibility of unpaid labour (Dowling, 2016; Fang and McDaniel, 2017; Folbre, 1995; Hirway, 2015; Ironmonger, 1996 among others). The former is considered to be a first step in the right direction as it would facilitate "workplace policies that *value* what parents do as caregivers as much as they *value* their professional achievements" (Elson, 2017). The latter would lead to a critical improvement in available information, enabling economists and sociologists to work with much more comprehensive data on the matter. This would, in turn, make it possible to operate more target-oriented by e.g. estimating how various policies and laws affect labour supply not only on the paid market but within the household as well[29].

In more general terms, policies can aim at one of two options: either women are encouraged to individually adapt to mimic stereotypically male behaviour in order to receive the same benefits men do *or* society has to collectively change towards a more egalitarian behaviour and attitude. The latter is what Folbre colloquially calls "a very big hassle" (1995). However, ultimately, the first step towards a more egalitarian society must be creating awareness of the role unpaid labour plays. This thesis aims to provide aid with this first step in the right direction. Regression results, existing literature and economic intuition indicate that it is only then that gender equality can be achieved, as:

> "*Gender equality requires that we redistribute the unpaid domestic and care work that remains after comprehensive investment in household-related infrastructure and public services, so that men and boys share this equally with women and girls*." (Elson, 2017)

[29] As an example, Elson describes how government choices on which economic sector to subsidise affects gender labour division: construction tends to cement current imbalances (pun intended) whereas investment in child and elderly care would redirect previously unpaid labour onto the paid labour market through the creation of jobs that would predominantly be taken up by women and thus decreasing the gender employment gap (2017).

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Appendix

Table A.1
Women's Reasons for working Part Time
Source: Time Use Survey 2008/09 Statistics Austria

	in absolute terms (using weights)	in %
I am taking care of children or adults in need of care	365,244	44.31
I do not want to work fulltime	89,823	10.90
other personal or family related reasons	160,180	19.43
I was not able to find a fulltime job	86,737	10.52
because of schooling, training or education	55,976	6.79
because of illness	11,337	1.38
other reasons	54,904	6.66

Existing literature suggests that partners' educational level as well as their share of paid and unpaid work matters for women's labour market decisions. However, naturally, not all individuals live with a partner. Furthermore, participation in the time use survey was not mandatory which led to the unavailability of some household members' information for the regression analysis at hand. Both these factors result in a stark reduction of the sample size when including partners' education and work. Therefore, the results including these additional regressors are reported separately in Table A.2.

Table A.2

Results: Extensive Margin by Gender with Partner Information

Source: Time Use Survey 2008/09 Statistics Austria

	Lmp				Hhwork				Care			
	Male		Female		Male		Female		Male		Female	
	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value	AME	p-value
ppaid	0.001	0.215	0.002	0.001	-0.001	0.207	0.000	0.635	0.000	0.724	0.000	0.383
punpaid	0.001	0.231	0.000	0.971	-0.001	0.551	-0.001	0.011	-0.001	0.135	-0.001	0.103
peduc	0.016	0.094	-0.005	0.721	-0.007	0.233	-0.008	0.117	0.007	0.273	-0.006	0.546
parent	0.005	0.771	-0.022	0.557	-0.007	0.876	0.035	0.068	0.188	<0.001	0.071	0.005
nchild06	-0.005	0.821	-0.192	<0.001	-0.067	0.173	0.020	0.194	0.280	<0.001	0.565	<0.001
nchild615	-0.011	0.540	-0.074	0.002	0.009	0.688	0.014	0.221	0.109	<0.001	0.183	<0.001
age	-0.011	<0.001	-0.014	<0.001	-0.004	0.079	0.001	0.029	-0.002	0.295	0.002	0.130
mabe	-0.003	0.883	0.132	<0.001	-0.031	0.562	0.011	0.535	0.006	0.902	0.004	0.873
maube	0.032	0.348	0.129	0.009	-0.042	0.570	-0.007	0.698	0.092	0.142	-0.003	0.935
stmei	0.047	0.127	0.279	<0.001	0.054	0.394	0.007	0.774	0.060	0.219	0.039	0.408
city	0.027	0.234	-0.014	0.747	0.022	0.697	-0.020	0.138	-0.053	0.197	-0.069	0.021
migbg	-0.020	0.489	-0.084	0.038	-0.006	0.924	-0.011	0.498	0.034	0.528	-0.042	0.211
Observations	1,479		1,619		1,479		1,619		1,479		1,619	

Notes: Regression results of estimating male and female paid and unpaid labour market participation for individuals aged 18-60 with additional information on their partner

Table A.3

Results: Extensive Margin of Childless Women

Source: Time Use Survey 2008/09 Statistics Austria

	Lmp		Hhwork		Care	
	AME	p-value	AME	p-value	AME	p-value
partner	0.030	0.324	0.023	0.258	0.040	0.037
age	-0.006	<0.001	0.005	<0.001	0.003	0.021
mabe	0.054	0.113	0.022	0.427	-0.008	0.688
maube	0.065	0.189	0.021	0.622	-0.008	0.830
stmei	0.178	0.002	-0.012	0.764	0.024	0.437
city	-0.051	0.157	-0.001	0.966	-0.043	0.072
migbg	-0.037	0.571	-0.029	0.495	-0.026	0.464
Observations	1,384					

Notes: Regression results of estimating paid and unpaid labour market participation for childless women aged 18-60

Table A.4

Results: Extensive Margin of Mothers

Source: Time Use Survey 2008/09 Statistics Austria

	Lmp		Hhwork		Care	
	AME	p-value	AME	p-value	AME	p-value
partner	-0.058	0.142	0.023	0.178	0.002	0.929
nchild06	-0.182	<0.001	0.012	0.378	0.454	<0.001
nchild615	-0.063	0.004	0.015	0.114	0.155	<0.001
age	-0.008	0.003	0.001	0.271	-0.005	0.025
mabe	0.134	<0.001	0.023	0.081	0.011	0.757
maube	0.175	<0.001	0.000	0.992	0.027	0.508
stmei	0.320	<0.001	-0.009	0.629	0.050	0.353
city	-0.053	0.298	-0.006	0.571	-0.031	0.358
migbg	-0.025	0.587	-0.010	0.526	-0.053	0.141
Observations	1,602					

Notes: Regression results of estimating maternal paid and unpaid labour market participation for mothers aged 18-60

Table A.5

Results: Intensive Margin of Unpaid Labour with Occupations

Source: Time Use Survey 2008/09 Statistics Austria

	Hhwork Supply		Care Supply	
	AME	p-value	AME	p-value
Intercept	0.734	0.002	1.657	<0.001
Occupation				
manager	-0.552	0.007	0.272	0.258
scient	-0.638	<0.001	0.515	0.024
techn	-0.391	0.011	0.474	0.012
clerk	-0.320	0.045	0.500	0.016
servsale	-0.182	0.241	0.141	0.475
agri	0.265	0.252	-0.182	0.505
craft	-0.011	0.950	0.019	0.935
machine	-0.201	0.325	-0.259	0.356
Individual Characteristics				
female	1.255	<0.001	0.915	<0.001
partner	0.482	<0.001	0.080	0.602
child06	0.170	0.132	0.616	<0.001
child615	-0.037	0.726	-0.612	<0.001
child1527	0.296	0.008	-0.760	<0.001
bighh	0.204	0.058	0.731	<0.001
age	0.038	<0.001	-0.016	0.021
mabe	-0.081	0.522	-0.289	0.102
maube	0.183	0.276	-0.532	0.017
stmei	-0.226	0.175	0.138	0.522
city	0.033	0.717	0.380	0.002
migbg	-0.256	0.020	0.180	0.140
Observations	3,566		1,333	

Notes: Regression results of estimating how many hours employed individuals aged 18-60 spend on paid work, household and care work