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Labour force participation and occupational outcomes among Italian women

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Abstract

This thesis is made of three related yet independent empirical studies, exploring the determinants of different labour market outcomes among women, using Italian data. The first study investigates the determinants of the reservation wage gap between unemployed women and men, using data drawn from the Italian Labour Force Survey (LFS). The results indicate that a large part of the gender reservation wage gap is explained by different job preferences between males and females, and by unobserved factors which may be associated with occupational discrimination. These factors shed light on the different employment rates between males and females.

The second study uses the Italian Sample Survey on Births to investigate the effect of housework and childcare on female labour force participation, and the relationship between child care and occupational attainment. The findings show that those mothers who receive help with housework and childcare are more likely to be employed three years after the birth of the child. In addition, the use of paid childcare options (nursery or baby-sitters) is positively associated with being employed in managerial positions, but negatively related to non-standard forms of employment such as temporary and part-time employment. In a country characterized by a lack of family-friendly policies, motherhood appears still to be a limiting factor for the career of women.

The third study uses the Italian LFS to investigate the determinants of self-employment and different types of self-employment among women. It also examines the determinants of hours worked and satisfaction with respect to hours worked of self-employed females. Our findings show little evidence of gender differences in the determinants of self-employment. However, women are less likely to work in self-employment categories that involve management of other employees. The determinants of hours worked differ between self-employed men and self-employed women. For example, the number of children is inversely associated with the hours worked by self-employed women but positively related to the hours supplied by self-employed men. This

is consistent with the traditional division of household work in Italian families. Finally, mothers working as employees are less satisfied with hours when they work long hours compared to those without children, whereas the opposite is found among self-employed women. Self-employment may offer the flexibility that helps Italian women to reconcile career with childcare responsibilities.

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CHAPTER 1: INTRODUCTION

1.1 Motivation and Aims

Although there has been an increase in female labour force participation (LFP) in all OECD countries, women are still less likely than men to participate in the labour force (i.e. to be either employed or looking for a job). Specifically, the LFP of women in OECD countries is at just 64%, about sixteen percentage points lower than the rate for men at 80.2% (OECD, 2018a). In addition, when women do participate in the labour force, they are less likely to find a job relative to their male counterparts, are less likely to be employed in high-skilled jobs than men, and work fewer hours than their male counterparts (European Commission, 2007; WEF, 2017; OECD, 2017b; OECD, 2018a).

Reducing gender differences in labour market outcomes is one of the most pressing challenges for developed economies today, as the achievement of equal opportunities between men and women has been found to favour economic growth and improve firms' productivity (Kabeer and Natali 2013; ILO, 2017).

Existing studies suggest that increased participation of women in the labour market has several beneficial effects (Del Boca and Locatelli, 2006; Casarico and Profeta, 2009, 2010; Campa, Casarico, and Profeta, 2010; ILO, 2017). Firstly, an increase in the proportion of women in the workforce may lead to an increase in competition among workers and expand the pool from which firms can select talented candidates, thus consequently improving the firm's productivity. Secondly, freeing women from domestic responsibilities may lead to an increase in households' demand for paid childcare and housework. Thirdly, the presence of two incomes in a household allows families to insure against financial shocks. Fourthly, having a job may have positive effects on overall well-being, as individuals view work as a part of their identity[1].

[1] An increase in the proportion of women in the workforce might also have some negative consequences for society. For example, there is a debate in the literature about whether the participation of mothers in the labour market has negative effects on their children's cognitive development and educational attainment. In fact, maternal employment in the early stage of a child's life might reduce the quality of mother-child

Promoting equal opportunities between men and women in terms of access to high-skilled jobs may also favour the productivity and growth of firms. In fact, the presence of females in corporate boardrooms is associated with positive effects on firm performance as women can provide different skills and expertise than those provided by men (Sabatier, 2015). In fact, females at the top boards of private companies usually come from different educational and professional paths, compared to their male counterparts (Hillman et al., 2000; Hillman et al., 2007). In addition, they tend to be more sensitive to risk, are more likely to adopt long-term strategies than men, and they are usually better prepared for meetings relative to men (Byrnes et al., 1999; Eckel and Grossman, 2002, Huse and Solberg, 2006; Eckel and Grossman, 2008).

Finally, improving the quality of jobs held by women is important as the expectation of better working conditions in terms of job stability, flexibility and higher wages may encourage them to enter the labour market, and so help reduce the gap in LFP between men and women (Powell,1999).

One of the factors that may explain gender disparities in the labour market is the fact that women are generally still doing most of the unpaid work in the household. In fact, in most OECD countries, women are responsible for caring for their relatives (both children and dependent adults) and doing the housework (OECD, 2018c). For this reason, existing studies have investigated the effect of household composition on a variety of labour market outcomes, namely reservation wages, female labour force participation, occupational attainment and job quality among women. Household composition may be able to explain the relatively weak performance of females in the labour market, since household responsibilities may constrain the time and effort that women can devote to paid work.

interactions by disrupting the formation of crucial mother-child attachments or by causing maternal stress (Waldfogel, 2002). However, empirical studies that estimate the effect of a mother's employment on child development do not find consistent evidence in support of such negative effects (for a review of this literature see e.g. Cooksey et al., 2009)

Brown et al. (2011) investigated the reasons behind the difference in reservation wages between unemployed females and unemployed males in the UK, focusing on the role of household composition. Analysis of reservation wages sheds light on the factors that influence the transition from unemployment to employment. In their study, Brown et al. (2011) found that the presence of pre-school children in the household explained a substantial part of the gender reservation wage gap in the UK, due to a positive effect of children on the reservation wages of women.

A strand of literature has investigated the relationship between domestic work and the LFP of females, finding that the availability of help with childcare and housework have positive impacts on a woman's probability of being employed. Stolzenberg and Waite (1984) found that a mother's probability of being employed in the US was positively influenced by the number of childcare workers per region. Del Boca (2002) found a positive relationship between the regional availability of nursery schools in Italy and the probability of entering the labour market after childbirth. Coen-Pirani et al. (2010) found that the introduction of different household appliances in the US between 1960 and 1970 had a positive impact on female LFP, by reducing the time that women spent doing housework.

Another set of studies has shown that the household composition is related to the type of jobs held by employed women. For example, Brown et al. (1980) investigated the determinants of occupational attainment of female employees, defined as the probability of being observed in one of the following occupation categories: professional technical, managerial, clerical, operatives, services and labourers. They found that the probability of being employed in one of these categories was strongly influenced by the number of children in the household. In addition, related studies focusing on female employees have shown that household structure has an impact on different job attributes, namely: the number of hours worked, temporary versus permanent employment, and public-sector

versus private-sector employment (Christofides and Pashardes, 2002; Gelbach, 2002; Barbieri and Sestito, 2008).

Finally, a set of studies has examined whether the household composition influences a female's selection into self-employment. Allen and Curington (2014) showed that in the US women with children were more likely to be self-employed (relative to being an employee), because the flexibility offered by this work arrangement allowed the possibility to balance family and work commitments. In contrast, men usually saw self-employment as an opportunity for having greater earnings. Furthermore, some studies used macro-level data to show that the proportion of self-employed women is higher in countries such as Italy, Greece and Spain, where the availability of childcare is relatively low (Thébaud, 2011; Noseleit, 2014).

In this thesis, we examine the relationship between household composition and different labour market outcomes among Italian females. Among all OECD countries, Italy is an interesting case for the analysis of females' labour market outcomes, given the extent of gender inequalities in LFP and work opportunities in this country. In 2017, the World Economic Forum (WEF) had ranked 144 countries based on the Global Gender Gap Index, which quantifies the magnitude of gender disparities in terms of participation levels, salaries, and access to high-skilled employment. Italy was at the 97th position, being one of the lowest OECD countries in this ranking (WEF, 2017).

In fact, the LFP rate of Italian females is low, being at 55.9% compared to the average 64% of other OECD countries (OECD, 2018a). In addition, the gender gap in LFP rates between men and women is at 19%, which is higher than the average 16% gap observed for OECD countries. The gender gap in LFP is arguably holding back the growth of the Italian economy: Casarico and Profeta (2010) have estimated that, for Italy, entry of 100,000 women into the labour market would increase GDP by 0.28 percentage points per year. This would allow the government to increase public spending by 30%, which

could in turn be used to fund public services for families such as the creation of new crèches and nursing homes.

Italian females also have more restricted access to traditional jobs compared to their male counterparts. According to the OECD (2017a), the proportion of Italian women with a part-time job is 32.4%, compared to 8.3% of Italian men. For other OECD countries, these percentages are 25.5% and 9.5%, respectively. The proportion of women in Italy with a temporary contract is 15.9%, which is marginally larger than 15% for Italian men (and also higher than 11.2% for both men and women in OECD countries).

Cultural factors are likely to play a role in explaining these differences in Italy. In fact, Italian families have a more traditional division of tasks compared to some OECD countries, whereby females are generally responsible for household chores and for caring for relatives (Ongaro, 2002). Such division in family duties may constrain the time that Italian women can dedicate to labour market activities, with consequent negative impacts on different aspects of a woman's career (as discussed in detail in Section 3.1 of Chapter 3).

Further, societal discrimination towards women may also be reflected in firm behaviour. For example, in the 2012 national survey, Excelsor, on hiring forecasts of Italian enterprises showed that employers more often prefer to hire men as they are "considered more suitable to carry out a job". Studies have shown that if employers believe that women will have more frequent career interruptions due to child rearing, they will discriminate against women by favouring the hiring of men (Campa et al., 2010) or paying lower wages to women (de la Rica et al., 2008; Mussida and Picchio, 2014).

Finally, in Italy there is a lack of family-friendly policies which makes the reconciliation between household responsibilities and career more difficult. For example, the provision of childcare for children younger than three is extremely limited and only 15% of children have access to government funded nurseries (Istat, 2014). In addition,

the presence of private kindergartens in the country is also very limited and their costs are unaffordable for most families (Chiuri, 2000).

This thesis presents three empirical studies focusing on the relationship between household structure and different labour market outcomes among Italian females. Each study aims to contribute to the existing literature in the following ways. The first empirical study uses data from the Italian LFS to investigate the determinants of reservation wages among females in Italy, and the determinants of the reservation wage gap between males and females. This has not attracted much attention arguably due to the shortage of data on reservation wages. The present study focuses on the role of household structure using detailed information such as the presence of adult relatives in the household. The presence of co-resident adults has been considered in empirical models of female LFP (e.g. Pagani and Marenzi, 2008) but not in models focusing on reservation wages. From a methodological point of view, this chapter uses quantile regression and a decomposition method applied across the entire distribution of the dependent variable, which has rarely been used in this literature. These methods may serve to capture unobserved factors related to female occupational segregation and perceived wage discrimination which may affect the reservation wage gap differently at different parts of the reservation wage distribution.

The second empirical study uses data drawn from the Italian Sample Survey on Births, to investigate the relationship between childcare, housework and the LFP of mothers. Previous studies examining the determinants of the LFP of mothers have usually focused on a variety of measures of housework and childcare, aggregated to a regional level (Stolzenberg and Waite, 1984; Del Boca, 2002; Coen-Pirani et al., 2010). In contrast, we employ measures of help with housework and childcare that are available within the household. This offers a different perspective since the use of household-level measures of domestic work is arguably more consistent with Becker's (1965) framework

of an individual's allocation of time. To the best of our knowledge, this study is also the first attempt to examine the relationship between childcare and the occupational attainment of mothers and job attributes. This analysis may help us to understand the occupational strategies adopted by mothers to reconcile family responsibilities with their career.

The third study uses the Italian LFS to investigate the determinants of different types of self-employment (specifically, being an entrepreneur, own-account professional freelance, professional freelance with employees, small-business owner, small-business owner with employees, or a family worker). Due to a shortage of data, existing studies have usually considered self-employment as a single category. In addition, we examine the determinants of hours worked by the self-employed which has not received a great deal of attention in the literature. This is important as working hours represent a measure of entrepreneurial performance, indicating the effort that is necessary as a productive input to help ventures survive and grow (Parker, 2009).

1.2 Structure and Content of the Thesis

This thesis consists of three related, yet independent, empirical studies, each exploring important topics in the areas of labour force participation and occupational outcomes of Italian females. Each of these studies uses individual level data and micro-econometric methods to analyse different labour market outcomes.

1.2.1 Overview of Chapter 2

Chapter 2 investigates the determinants of the reservation wages of unemployed women and the determinants of the reservation wage gap between unemployed women and men in Italy, using data drawn from the Italian Labour Force Survey (LFS). Analysis of reservation wages can shed light on explain the factors influencing the transition of unemployed individuals into employment. This chapter explores the role of household composition which is expected to influence reservation wages, especially for women. To

do this, we use detailed measures of household structure capturing the number of dependent children and the number of other adults in the household. We also explore the importance of preferences over non-wage job attributes (permanent versus temporary contracts, and short versus long commuting distances) in determining reservation wages.

This study uses quantile regression analysis and conducts decomposition of reservation wages across the entire distribution. The quantile regression approach allows for uncovering unobservable factors such as perceived wage discrimination, which might affect the reservation wages of females at different points of the reservation wage distribution.

The findings show evidence of different determinants of reservation wages by gender. For example, the presence of a co-resident partner and dependent children are positively related to the reservation wages of males but unrelated to the reservation wages of females. In contrast, the presence of other adults is only (negatively) related to the reservation wages of females. With respect to the decomposition analysis, we find that the gender reservation wage gap in Italy is not constant over the reservation wage distribution but larger at its lower end. This might be due to residual factors related to perceived discrimination and occupational segregation of women into low paid jobs.

1.2.2 Overview of Chapter 3

Chapter 3 investigates the role of housework and childcare on female LFP, using two measures of help with childcare and housework that are available within the household, namely the partner's engagement with childcare, and the availability of other individuals to help with housework. It also investigates the relationship between childcare and a wide range of different labour market outcomes, namely occupational attainment (whether the individual is a blue-collar worker, white-collar worker, manager, or self-employed), number of hours worked, type of contract (part-time versus full-time, and temporary

versus permanent employment), and sector of employment (private sector versus public sector employment).

The data used for this chapter is the Italian Sample Survey on Births, which surveys mothers of two-year-old children about their employment status and type of occupation. It also provides detailed information on the sharing of housework tasks within the household and the availability of different formal and informal childcare options.

A number of econometric models are estimated in this chapter, depending on the nature of the dependant variables analysed. Probit models are used for binary outcome variables (i.e. female LFP, type of contract, and sector of employment), whereas a multinomial logit model is employed for the analysis of the determinants of a mother's occupational attainment, which is a categorical variable taking values from 0 to 3. An OLS model is used to estimate the determinants of hours worked.

Secondly, since the estimation of the effect of childcare on a mother's labour market outcome is subject to potential sample selection bias, different econometric strategies are applied. For example, the number of hours worked is modelled through the two-step approach proposed by Heckman (1979). For the remaining models, where the dependent variables are binary, we use the maximum likelihood estimator for probit regression with sample selection provided by de Ven and Praag (1981).

The findings suggest that a mother's probability of being employed is positively associated with the partner's engagement in domestic work. Mothers whose partners have the highest level of childcare engagement are 20 percentage points more likely to be employed. We find a relationship between the type of occupation held by mothers and the availability of childcare. For example, mothers who make use of formal childcare arrangements are less likely to work as blue-collar workers, compared to being white-collar workers. Self-employed mothers and mothers in management positions tend to rely more on flexible childcare options such as babysitters. Lastly, women who rely on paid

childcare options (childminders, public or private nursery schools) are found to spend more time in the labour market.

1.2.3 Overview of Chapter 4

This chapter uses the Italian LFS to investigate gender differences in the determinants of self-employment - defined as the probability of being self-employed compared to being wage-employed - and the determinants of different types of self-employment (specifically, being an entrepreneur, own-account professional freelance, professional freelance with employees, small-business owner, small-business owner with employees, or a family worker). In addition, it examines gender differences in the determinants of hours supplied, and satisfaction with respect to hours worked for both self-employed individuals and employees. We examine the role of household composition which may influence the individual's selection into different types of jobs as well as the number of hours that can be dedicated to the labour market.

From a methodological point of view, a variety of econometric models are used. The determinants of self-employment and the determinants of different types of self-employment are estimated using probit and multinomial logit models, respectively. The determinants of hours worked are estimated by means of two econometric methods: OLS; and the two-step model proposed by Lee (1983) to take into account potential sample selection bias. Finally, ordered logit and OLS models are employed to investigate the determinants of satisfaction with hours worked.

Our findings show little evidence of gender differences in the determinants of self-employment but different determinants of hours supplied are found between self-employed men and self-employed women. In fact, controls for family members are inversely associated with the hours worked by self-employed women but positively related to the hours supplied by self-employed men. We argue that this is consistent with the hypothesis of a traditional division of household work in Italian families. We also find

that, among self-employed women, having children is positively related to satisfaction with hours. Mothers working as employees are more satisfied with hours than those without children when they work less than 30 weekly hours, but less satisfied than those without children when they work more than 30 weekly hours. It is apparent that the flexibility offered by the self-employment appears to be more compatible with childcare responsibilities. Since social norms such as the unbalanced division of household labour affect mostly the careers of females, in the absence of family policies, self-employment appears to represent a potential solution that allows them to combine work and domestic responsibilities.

CHAPTER 2: THE DETERMINANTS OF FEMALE RESERVATION WAGES AND THE GENDER RESERVATION WAGE GAP IN ITALY

2.1 Introduction

In theoretical models of job search, the individual's decision to enter the labour force is made by comparing the wage offers they receive with their reservation wage, the lowest wage at which they are willing to work (Narendranathan and Nickell, 1985). Since the concept of the reservation wage plays a key role in understanding the transition into employment, a number of empirical studies have explored the determinants of reservation wages using data from OECD countries such as the US, Australia and the UK (e.g. Feldstein and Poterba, 1984; Hui, 1991; Blackaby et al., 2007). These studies have found that an individual's reservation wage depends upon regional unemployment rates, the level of unemployment benefit, and personal characteristics such as gender, nationality and education. Household composition has also been found to influence the reservation wage of an individual. For example, Hui (1991) showed that the presence of dependent children is positively associated with the reservation wages of unemployed youths in Australia. Haurin and Sridhar (2003) found that the reservation wages of the unemployed in the US are negatively related to marital status but positively related to the number of children in the household. Finally, using data from Germany and the UK, respectively, Prasad (2003) and Brown et al. (2011) show that the determinants of reservation wages vary with gender, which might reflect males and females valuing the time spent in family-related activities differently, since the reservation wage represents the opportunity cost of supplying labour (Caliendo et al., 2017).

Despite the considerable importance from a policy perspective, there are a limited number of studies focusing on the determinants of reservation wages, which is probably due to the shortage of data on reservation wages. The analysis of reservation wages is of particular interest for Italy, being a country with a relatively low employment rate, where

only 57% of the working-age population are employed, compared to the average of 67% for all OECD countries (OECD, 2017a). In addition, the gap in the employment rates between males and females (of 19%) is larger than the average 15% of OECD countries, with 66% of men and 48% of women being employed in Italy. The relatively low presence of women in the labour market is a real concern for policy-makers in OECD countries. In fact, the increases in female employment rates in recent decades have been found to benefit both firm performance and economic growth (e.g. Adams and Ferreira, 2009). Hence, policy-makers are now targeting employment policies aimed at ensuring equal access in opportunities and working conditions for men and women (European Commission, 2016). Nevertheless, in all OECD countries, females are still experiencing lower rates of labour force participation (LFP) and higher unemployment rates compared to males, and this is reflected in their reservation wages, which are reported to be systematically lower (see Brown et al., 2011).

The distribution of reservation wages among unemployed females in Italy is also more dispersed - with a longer left tail - compared to their unemployed male counterparts (Istat, 2011), but this has not been investigated in existing studies. One possible explanation for the different shapes of the reservation wage distributions between unemployed males and unemployed females may be the existence of gender discrimination and female segregation into low paid occupations. Existing studies have found that in Southern European countries, where the labour force participation of females is relatively low due to less job opportunities, women are more often segregated into occupations with low degrees of responsibility and remuneration, compared to men. For example, de la Rica et al. (2008) showed that females are more likely to suffer from career interruptions, due to household responsibilities and an absence of public policies to reconcile work and family. In this context, employers believe that women may leave employment faster than men and use statistical discrimination in wage-setting, that is,

they offer lower wages to women in order to offset training costs, in occupations where specific training is needed to perform a job. As a result, females (especially when low educated) tend to be found in occupations that are located at the lower part of the wage distribution, which typically captures entry-job wages[2].

Mussida and Picchio (2014) investigated the factors behind the gender wage gap in Italy and found evidence of a 'sticky floor', i.e. a larger gap at the bottom of the wage distribution. They proposed an additional explanation to de la Rica et al (2008). They noted that - given the lack of affordable childcare services and time-flexible jobs in Italy - the labour supply of women to the firm is usually less elastic than that for men due to stronger preferences for nonwage job characteristics such as close commuting distances and time flexibility[3]. Hence, employers may exploit the different gender-specific supply elasticities and enforce discriminatory practices to pay lower wages to women[4]. These practices would emerge especially at the bottom of the wage distribution where the family budget constraints are more likely to be binding and family care is the most likely affordable option. Caliendo et al. (2017) linked the gender wage gap with the gender gap in reservation wages, using German data. They performed a decomposition analysis of the gender wage gap and included measures for reservation wages as well as controls for socio-demographic characteristics, labour market experience and personality traits. They

[2] Similar findings come from Polacheck (1981) who used US data to show that – due to societal discrimination in the distribution of family responsibilities - women self-select into occupations where the cost of career interruption is low; cf. Dolado et al (2004). Blau and Kahn (2006) noted that in the absence of parental leave provision women are more likely to quit or lose their job after pregnancy and re-enter the labour market holding occupations that are associated with shorter hours and lower pay.

[3] This explanation is based on the previous findings of Hirsch et al. (2010) who used German data to show that at a firm level the labour supply of women is less elastic than for men, due to different preferences over nonwage job characteristics such as job location and flexible schedules. Similarly, Barth and Dale-Olsen (2009) found that female firm-level labour supply is less wage elastic than for males and this difference accounts for a large portion of the gender wage gap in the US. In addition, supporting evidence shows that in Italy time-flexible jobs are rare (Del Boca, 2002), and flexible forms of employment - such as part-time contracts - are associated with wage penalties due to occupational segregation in low-skilled jobs (Matteazzi et al., 2014).

[4] In a related literature, Manning (2003) showed that employers may acquire monopsony power in a context with many firms competing for workers, and not only in the classic case of a single employer (Robinson, 1933). Specifically, he found some evidence that upward-sloping labour supply curves at a firm level, may arise as a consequence of heterogeneous preferences among workers, search frictions, and mobility costs.

found that the wage gap between men and women became small and statistically insignificant once they controlled for reservation wages. They concluded that - among other possible explanations for this result - women might anticipate discrimination in the labour market and lower their reservation wages accordingly.

The first aim of this chapter is to investigate the determinants of the reservation wages of unemployed females in Italy, using the Italian Labour Force Survey (LFS). This question has not attracted much attention in the literature despite the low employment rate of Italian females[5]. We focus on exploring the role of household composition which is particularly important for the case of Italy given the traditional division of household labour in Italian households, whereby males are the main breadwinners and females are generally responsible for household chores and for caring for other relatives (Ongaro, 2002). In addition, Italian households are usually more extended than those in other OECD countries and family members tend to maintain strong ties (Luciano et al., 2012). For example, in 2010 the number of elderly individuals living in the same household was higher than in the rest of the EU with it also being noted that children tend to leave their parents' house at older ages (Iacovou and Skew, 2010). For this reason, recent surveys conducted by the Italian National Institute of Statistics have adopted the definition of the family as 'all persons related by marriage, kinship, affinity, adoption, guardianship, cohabiting and having their usual residence in the same municipality' (Istat, 2011). Related studies have found household composition to be an important factor influencing the probability of leaving unemployment for an Italian woman since they are usually responsible for the care of other relatives in the household. For example, Pagani and

[5] The employment rate is defined as the ratio between the employed and working-age population (OECD, 2017). Although our focus is only on the unemployed, previous studies suggest that inactive individuals respond to incentives to enter the labour market in the same way as the unemployed. For example, Blackaby et al. (2007) use UK data to show that the elasticity of the reservation wage and exit probability with respect to state benefits and the arrival rate of job offers for the inactive is the same as for the unemployed. Hence, our analysis may also serve to explain the low labour force participation rate of Italian females - defined as the ratio between females in the labour force and those in the working-age population.

Marenzi (2008) showed that the presence of adults in the household (other than the partner) increases the labour force participation of Italian women by providing informal help with domestic activities. However, they do not relate this to reservation wages. To shed further light on this area, we investigate whether a link exists between other cohabitants in the household and reservation wages. The Italian LFS is ideally suited to this study because it is the only Italian dataset containing detailed information on reservation wages as well as detailed information on the household composition of unemployed individuals.

We also explore the importance of accounting for job preferences when estimating the determinants of reservation wages. In particular, we argue that different reservation wages between unemployed males and unemployed females may arise as the consequence of different preferences for nonwage job attributes. This question has not attracted much attention in the literature despite existing studies having demonstrated that women have different preferences with respect to job characteristics such as job security, time flexibility and commuting distance. For example, Sandow (2008) used Swedish data to investigate commuting propensities by gender, and found that employed females are prone to commute shorter distances than working males. Grund (2013) investigated the reasons for changing job, focusing on a sample of German employees who quit their job after finding a new one. They found that men change jobs due to favouring chances of promotion and increases in job security. In contrast, women value other attributes such as flexible working hours and commuting time. Previous studies focusing on the determinants of reservation wages have rarely considered the role of job preferences, possibly due to the scarcity of this type of information in surveys. One exception is Sestito and Viviano (2011) who used Italian data to explore differences in reservation wages amongst regions, and controlled for preferences over permanent versus temporary contracts, and short versus long commuting distances. They found that reservation wages

are positively related to commuting distance and the preference for permanent employment. However, they did not study the interaction between job preferences and gender[6].

From a methodological point of view, we compare the findings from a standard OLS model with that from quantile regression analysis, to explore the determinants of reservation wages across the entire reservation wage distribution, and not only at its conditional mean. This method has not been used in the literature on reservation wages despite the fact that it provides a richer understanding of the data. In fact, the effect of individual characteristics may differ along the reservation wage distribution reflecting unobservable characteristics such as different wage and occupational aspirations before entering the labour market. Women at the bottom of the reservation wage distribution might have lower wage expectations due to stronger preferences for time-flexible jobs. In contrast, women at the top end of the reservation wage distribution may not be affected by gender discrimination due to better skills (de la Rica et al., 2008; Mussida and Picchio, 2014), and may also target less flexible jobs since they are more likely to be able to afford to pay for the care of relatives.

The second aim of this chapter is to explore the determinants of the gender reservation wage gap, by conducting decomposition analysis. This question has also not been addressed before for the case of Italy, despite the possibility of it being able to help explain the reasons behind the large gap in the employment rate between males and females. Brown et al. (2011) is the only study which has used the standard decomposition method by Oaxaca (1973) to analyse the reservation wage gender gap for the UK. We

[6] Sestito and Viviano (2011) investigate the determinants of reservation wages among unemployed individuals in Italy, which is a similar research area to the present study but has a different goal. They investigate the determining factors of the differences in reservation wages between Southern and Northern regions in Italy. In contrast, we examine how the determinants of reservation wages differ by gender, focusing attention to the role of household structure. Sestito and Viviano (2011) use an old version of the LFS which does not contain detailed information of household composition. Finally, the two studies differ with respect to the period of analysis: Sestito and Viviano (2011) focus on the period 1993 to 2002, previous to the 2008 financial crisis, whereas we use data from 2009 to 2011.

compare this with the method proposed by Melly (2005) which allows for the decomposition of the gender reservation wage gap at different quantiles. We do this to capture unobserved factors potentially related to female occupational segregation and perceived wage discrimination which may affect the reservation wage gap, at different points of the distribution.

Our findings show evidence of different determinants of reservation wages by gender. For example, regarding household composition, the presence of a co-resident partner and dependent children are positively related to the reservation wages of males but unrelated to the reservation wages of females. In contrast, the presence of other adults is only (negatively) related to the reservation wages of females. With respect to the decomposition analysis, differences in observable characteristics between unemployed males and females account for a small portion of the reservation wage gap. Using the decomposition method of Melly (2005), we show that the gender reservation wage gap in Italy is not constant over the distribution but larger at the lower end. This is mainly due to the effect of residual factors affecting the reservation wages of females at the bottom of the distribution. We argue that these women may be targeting jobs that are associated with lower wages, due to a preference for time-flexibility as well as due to perceived discrimination in the labour market.

2.2 Background Literature

2.2.1 Theoretical Framework

The classical model of labour supply assumes that agents are fully informed about the distribution of job vacancies and know the universal wage at which all jobs are offered in the labour market[7]. They choose the optimum level of hours they are willing to work by trading leisure time with work. In other words, they may only select themselves into two possible states: employment, if they work a positive number of hours; and inactivity, if

[7] The classical model of labour supply assumes that jobs are all offered at the same wage rate.

they work zero hours. In this model, no attention is paid to the time or the cost of looking for work (Gravelle, 2004).

The optimal job search theory pioneered by McCall (1970) relaxed the hypothesis of perfect information and described job search as a continuous process of gathering information. McCall (1970) set up a model where agents maximised their expected present value of the future earnings stream associated with a particular job, over an infinite time period. In this model, the process of job search is characterized by a "stopping rule", that is, aspiring workers stop looking for a job when they are offered a wage that is equal or greater than a critical number, defined as the *reservation wage*. The reservation wage is determined by the arrival rate of job offers, the shape of the wage offer distribution, and individual-specific costs associated with job search.

This seminal study by McCall (1970) was expanded by other studies which relaxed the assumptions of an infinite lifetime of an individual (Gronau, 1971), a known distribution of wage offers (Rotschild, 1974), and a constant reservation wage over time (Kiefer and Neumann, 1979). These models provide a theoretical context for empirical studies exploring the determinants of reservation wages (see e.g. Lancaster and Chesher, 1983; Jones, 1988).

2.2.2 Empirical Evidence on the Determinants of Reservation Wages

A number of studies have explored the relationship between reservation wages and the duration of unemployment from an empirical perspective (Jones, 1988; Hui, 1991; Haurin and Sridhar, 2003), assuming that they are determined simultaneously. Individuals with a higher reservation wage have a lower chance of finding a new job. At the same time, being unemployed for a prolonged period may also affect an individual's expectations, with a negative impact on their reservation wage. Jones (1988) developed an instrumental variable (IV) model which allowed for the joint determination of reservation wages and unemployment duration. This model controlled for explanatory variables such as age,

gender, marital status, education and region. Since the focus of this study was on the effect of reservation wages on unemployment duration, Jones also included unemployment insurance benefits as an instrument for the reservation wage. Based on British cross-sectional data from the 1982 Economist Intelligence Unit survey, Jones (1988) found a positive effect of reservation wages on unemployment duration. However, he did not estimate the effect of unemployment duration on reservation wages. In addition, his model did not consider the role of personal characteristics such as household composition, and preferences for the type of job, possibly reflecting a lack of information in the data. Since these variables have been found in the more recent literature to play an important role in modelling both reservation wages and unemployment duration (see for example, Haurin and Sridhar, 2003; Sestito and Viviano, 2011), the results from Jones' study may be subject to potential omitted variable bias.

An alternative model was presented by Lancaster and Chesher (1983), who adopted a non-parametric method to deduce key parameters of job search theory without making assumptions regarding the distribution of wage offers. They computed elasticities of the reservation wage with respect to unemployment benefit and the job arrival rate, only using information on the reservation wage and the expected wage of 653 job-seekers from the 1984 British PEP National Survey of the Unemployed. They found that an increase of £1 in unemployment benefit could lead to a rise in the reservation wage by 21p for those unemployed for more than a year, and by 25p for those unemployed for less than 13 weeks. They also found that a 10% increase in the arrival rate of job offers increased the reservation wage by 27p and 23p respectively for the same two groups. Lancaster and Chesher (1983) did not investigate whether these elasticities differed by gender, despite the fact that their model allowed for the separation of the analysis into distinct groups of individuals. Furthermore, they did not investigate the role of individual

characteristics such as household structure and job preferences, which may play an important role in determining the reservation wage.

Following the seminal work of Jones (1988) and Lancaster and Chesher (1983), other studies have used their framework to investigate the effects of unemployment compensation benefit and local unemployment rates on reservation wages. For example, Haurin and Sridhar (2003) analysed the impact of local unemployment rates on the reservation wages of 247 unemployed individuals from the US Panel Study of Income Dynamics (PSID). Their model accounted for personal characteristics such as gender, race, marital status and the number of children, and past job experience as captured by two dummy variables indicating whether the unemployed individual was a job leaver or a job loser. They employed a two-stage least squares (2SLS) regression approach to control for the potential endogeneity that may arise when including unemployment duration as an explanatory variable, and used job tenure as an instrument for job search duration. Their results showed that reservation wages were not affected by the local unemployment rates, whereas being male and having an additional child increased reservation wages by 0.26 and 0.18 percentage points, respectively. These findings were also in line with the study by Hui (1991) who estimated a similar model focusing on a sample of 846 young unemployed individuals from the Australian Longitudinal Survey. One question that was not investigated by Haurin and Sridhar (2003) and Hui (1991) concerns whether the effect of having children differed by gender. For example, previous studies have found that having children had differential effects on the labour force participation of men and women (Angrist and Evans, 1998), but they did not investigate whether this was due to an indirect effect on the reservation wage. Another potential source of bias may be the omitted effect of job preferences because individuals set their reservation wage depending on job attributes (such as short versus long commuting

distance, permanent versus temporary contract), when they are looking for a job (Sestito and Viviano, 2011).

Prasad (2003) focused on a sample of 2,371 unemployed individuals from the German Socio Economic Panel (GSOEP) to investigate the relationship between the reservation wages of unemployed workers and macroeconomic factors such as regional unemployment rates and the generosity of the unemployment compensation system. Following the IV method proposed by Jones (1988) and treating the data as repeated cross-sections due to potential sample attrition, he found the reservation wage to be positively related to the presence of dependent children. At the same time, having a partner and other employed individuals in the household were found to be negatively related to the reservation wage. In line with Haurin and Sridhar (2003), he found a statistically insignificant correlation between reservation wages and unemployment rates, measured at both the aggregate and regional levels. Surprisingly, the availability of unemployment compensation in West Germany over the period 1987 to 1997 was inversely associated with reservation wages but the regression analysis did not account for the duration of job search. Additionally, this result was in contrast to the other findings in the literature, using data from the US, (e.g. Feldstein and Poterba, 1984) and the UK (e.g. Blackaby, et al. 2007; Addison et al. 2010) that found a positive link between unemployment benefit and reservation wages.

In a related study, Sestito and Viviano (2011) investigated the geographical distribution of reservation wages in Italy, using data from the Italian Labour Force Survey relating to the period 1993 to 2002. They estimated an OLS model of the determinants of reservation wages controlling for individual characteristics, such as age, gender, education, marital status, region of residence, individual preferences about the type of job (public versus private-sector employment, and whether the job was sought within a commuting area), and a vector of local labour market characteristics. In this study, Sestito

and Viviano (2011) argued that self-reported reservation wages could be subject to a potential source of bias as this information was not collected for both employed and inactive individuals, but only for the subsample of job-seekers. They attempted to account for this potential sample selection problem by means of two different strategies. The first strategy used a two-step procedure to account for the predicted probability of being observed in the subsample of individuals who were looking for a job, rather than being observed as inactive or employed. The second strategy was to estimate the determinants of reservation wages via OLS focusing on a 1404 subsample of childless, unmarried individuals aged between 23 and 32 and with a university degree, who might arguably be less affected by such sample selection. They argued that young individuals with a university degree are less likely to stay out of the labour force because they would want to repay the sizeable investment made in education. In addition, childless individuals would be less likely to be inactive since they do not have other non-market alternatives such as childcare which might keep them out of the labour force. The findings showed that reservation wages were lower in regions with higher rates of unemployment, when the potential sample selection was taken into account. Preferences for commuting outside the region of residence and for permanent employment were also positively related to reservation wages. The two aforementioned strategies for dealing with sample selection were, however, subject to very strong assumptions. First, Sestito and Viviano (2011) identified the two-step model just by imposing different functional forms for the first and second stage equations. In fact, they admitted the impossibility of finding an instrumental variable that was correlated with the probability of being unemployed but unrelated to reservation wages. Second, the results obtained via the second method were based on a very small sub-sample of the entire unemployed population. Hence, generalising these results to all individuals in unemployment may be inappropriate. Additionally, although this study acknowledged that having a spouse affected an individual's reservation wage,

the role of other household variables such as the number of dependent children or co-resident adults was not considered. Finally, the effect of household variables on reservation wages may vary by gender, and this question also remains unexplored.

2.2.3 Gender Differences in the Reservation Wage Gap

The evidence from studies from a range of countries supports the existence of a gender gap in reservation wages, with males having higher reservation wages than females (Jones, 1988; Hui, 1991; Haurin and Sridhar, 2003, Sestito and Viviano; 2011). From a theoretical point of view, such a gap may be a consequence of different opportunity costs and different aspirations about wages before entering the labour market. In the empirical literature, there are only two studies that have attempted to investigate why reservation wages differ by gender, indicating a lack of research in this field.

In the aforementioned study, Prasad (2003) investigated gender differences in the determinants of reservation wages by running separate OLS regression for males and females. For this part of the analysis, he focused on a sub-sample of 547 individuals who registered with the unemployment office in the month of the interview, and for whom data on unemployment benefits was available. His findings showed that the reservation wages of men were positively affected by the presence of dependent children in the household (8.2 percentage points) and negatively affected by additional employed cohabitants (7 percentage points), but the reservation wages of women were not influenced by these variables. Having vocational training was positively related to the reservation wages of men but unrelated to the reservation wages of females. In contrast, a university degree had a larger positive effect on the reservation wages of females (29 percentage points) compared to men (21 percentage points). The elasticity of reservation wages with respect to unemployment benefits was more than twice as large for women (0.161) than for men (0.069), whereas the elasticity of reservation wages with respect to the past wage was found to be similar for males (0.17) and females (0.18). A one-percent

increase in net household income reduced the reservation wages of men by 9.2 percentage points, but did not influence the reservation wages of females. Finally, other control variables such as nationality, marital status and the regional unemployment rate were found to be unrelated to the reservation wages of both males and females.

One potential limitation of this study lies in the focus on the small subsample of unemployed individuals who registered with the unemployment office in the month prior to the interview. This may expose the analysis to a sample selection issue because 1824 unemployed individuals were excluded due to a non-random selection process. For example, individuals who were not registered at the job centre may have lower arrival rates of job offers (and consequently lower reservation wages), due to the latter depending on the intensity of job search (Brown and Taylor, 2013). The second limitation is the omission of preferences with respect to the type of job, which has been found to affect the reservation wages of unemployed individuals (Sestito and Viviano, 2011).

Brown et al. (2011) investigated the reasons behind the gender reservation wage gap in the UK, focusing on a sample of 12,291 individuals from the British Household Panel Survey observed over the period 1999 to 2008. They used the decomposition method by Oaxaca (1973) which allows for splitting the difference in the means of the reservation wages between two groups into an explained component and an unexplained component. Their model included controls for education, income and household structure, which was captured by the number of children in the household, the number of cohabiting employees and marital status. In line with the hypothesis that having children exerts a different effect on the labour force participation of males and females, they also compare the results for five different sub-samples of individuals without children and individuals with children of different ages. They found that the presence of pre-school children in the household was the main factor determining the portion of the reservation wage gap that can be explained by individual characteristics. Specifically, having children

was found to narrow the gender gap in reservation wages, due to an increasing effect on the reservation wages of women.

To summarise, the studies by Prasad (2003) and Brown et al. (2011) recognized the important role played by household variables in explaining differences in the reservation wages of males and females, evaluated at their means. However, they did not investigate whether such differences reflect different job preferences between men and women with respect to attributes such as job security and commuting distance. Furthermore, the examination of gender differences using standard techniques such as OLS and the Oaxaca decomposition is based on the assumption of a constant relationship between the explanatory variables and reservation wages. However, the effect of individual characteristics may differ along the reservation wage distribution reflecting, for example, different aspirations about wages before entering the labour market. Hence, we contribute to the existing literature by decomposing differences in the distributions of reservation wage between males and females. As we discuss in more detail in Section 2.4, we do this by means of quantile regression analysis and decomposition of the gender reservation wage gap across the entire reservation wage distribution.

2.3 Data

The analysis presented in this chapter is based on the Italian Labour Force Survey (LFS), which is conducted by the Italian National Institute of Statistics (Istat) that has provided information on the Italian labour market since 2004. In this survey, the population of interest are all members of 280,000 households which are randomly selected from the Italian population registers every year. The concept of household used by the Istat corresponds to the definition of a *de facto* family, that is, a set of people bound by marriage, kinship, affinity, adoption, guardianship or affection, cohabiting and having their usual residence in the same municipality.

The sampling design of the LFS is two-stage stratified cluster sampling, with stratification of Municipalities (corresponding to the NUTS-3 level of the administrative division used by the European Union) in the first stage and households in the second stage[8]. Each individual in the household is interviewed twice according to a rotation pattern described by Istat (2017b). With the collected data, Istat made available three types of files: two longitudinal data files, in which respondents were observed twice, either on a quarterly or an annual basis; and a cross-sectional version with quarterly observations.

Since the longitudinal files do not contain a continuous variable describing the reservation wage of unemployed individuals, we focus on the three repeated cross-sections (2009, 2010 and 2011) that include information on reservation wages for 58,288 unemployed individuals, living in 53,232 households[9]. The survey includes a question designed to elicit the monthly reservation wages of the unemployed, specifically, '*what is the lowest monthly (net) amount of money that you would be willing to accept to start a new job?*' - translated from the original Italian question: '*qual è il guadagno minimo mensile (netto) per il quale sarebbe disposto a lavorare?*' [10] The survey also includes other information on unemployment such as the duration of job search, preferences about the job sought (specifically, whether they are looking for a job within a commuting area, work on a part-time or full-time basis, or work on a permanent or temporary basis).

The Italian LFS is ideally suited to this study as it is the only Italian dataset containing detailed information on the employment situation as well as on the household composition of individuals, such as the number of dependent children, the presence of a

[8] Sample weights are not used in this study, as standard errors are clustered at the household level. Solon et al. (2013) show that weighting may reduce precision of the estimates when the individual-level error terms are clustered within a group. In keeping with their conclusions, we first perform a Breusch-Pagan test and - having failed to reject the null hypothesis of homoscedasticity - we report robust standard errors.
[9] During this period, Italy was experiencing an economic downturn caused by the financial crisis of 2008.
[10] The reservation wage question is only asked to the unemployed.

partner in the household and the presence of other relatives living in the household, and provides information on the reservation wages of the unemployed.

In general, previous empirical studies have analysed the reservation wage, measured as the minimum *hourly* rate that an individual would be willing to accept for a new job. However, the Italian LFS only allows the construction of a *monthly* measure of the reservation wage, because individuals were not asked how many hours per month they were willing to work for this wage. For this reason, we focus our analysis on 22,447 individuals aged between 16 and 64 looking for full-time employment. The focus is on full-time jobs because the concept of part-time employment is not explicitly defined in terms of hours, and it is not possible to construct a comparable measure of the reservation wage for those individuals looking for part-time jobs[11]. For the same reason, we do not include in the analysis 13,878 individuals who were looking for a job either as self-employed or employees. We also exclude 139 observations whose reservation wage was equal to zero due to potential coding errors - given that unpaid work is not legal in Italy[12] - and 6 observations with reservation wages between €1 and €11, after performing an outlier analysis[13]. Finally, the selected sample was reduced to 16,501 observations after removing 5,508 observations due to missing values (see Table 2.1).

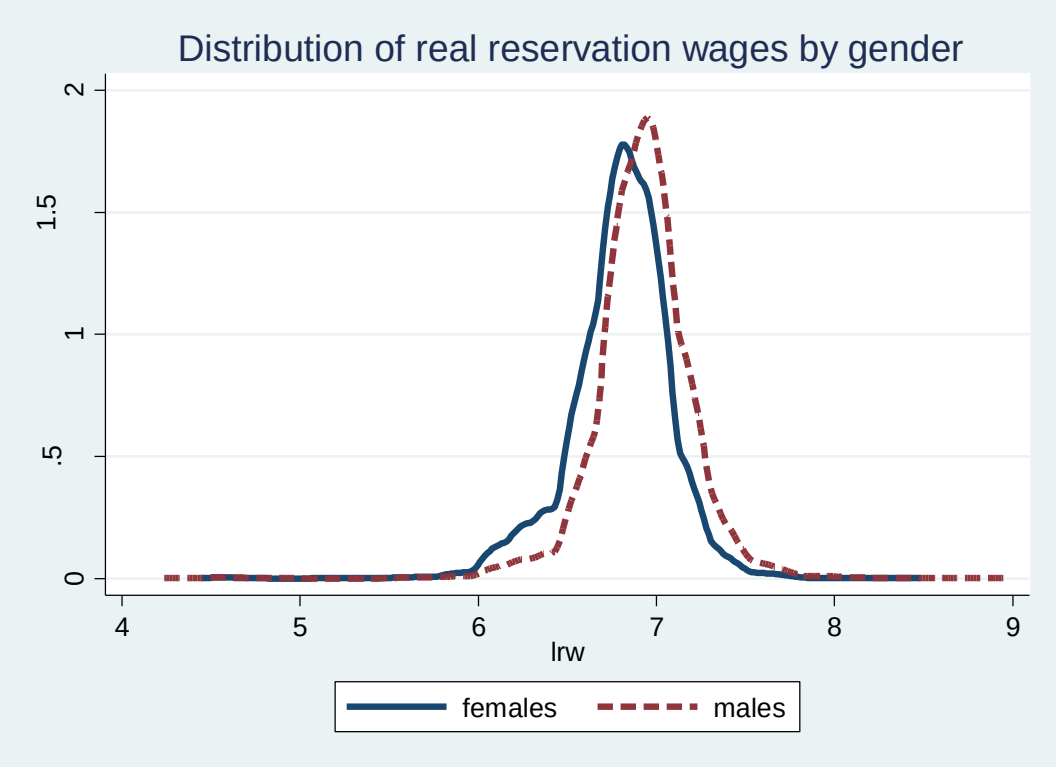
[11] The Italian law defines explicitly full-time contracts as those including 40 weekly hours of work (see Legislative Decree 66/2003 art.3c.2). Excluding unemployed individuals looking for part-time work may expose the results to potential bias. Hence, as a robustness check, we have conducted the same analysis focusing on the entire sample of unemployed individuals, and included dummy variables to control for part-time or full-time preference (no preference was the base category). We found the results to be robust to these changes; these results are not shown, but are available on request.

[12] See Judgment of Supreme Court of Cassation n. 1833 of 2009.

[13] Since we were concerned that observations whose reservation wage is close to zero may be due to coding errors, we performed an analysis of outliers as suggested in Chen et al (2003). First, we estimated the model of the determinants of reservation wages by OLS (as described in equation (2.1) - Section 2.4). Second, we analysed the distribution of predicted error terms using studentized residuals and the leverage-versus-squared-residual plot, available in the STATA software package. We decided to remove the aforementioned 6 observations due to abnormal residuals and leverage. As robustness check, we also ran the regression analysis with and without including these 6 observations and our results remain stable (the results are available on request).

The estimated kernel densities of the logged real monthly reservation wages for the 6,388 females and 10,113 males in the sample are shown below (Figure 2.1) [14]. The average monthly reservation wage reported by the sample of unemployed individuals was €1006. For the subsamples of males and females, it was, respectively, €1054 and €930[15]. The distribution of the reservation wages (in logs) of unemployed males was more centred on the mean (6.9) compared to females, whose distribution was more skewed to the right[16].

Figure 2. 1 - log monthly real reservation wages



[14] To deflate the reservation wage, we used the consumption price index for Italy provided by the Istat. The index was computed for each quarter of the interview, using the first quarter of 2009 as the base. Specifically, Price Index $= \frac{\text{prices (at quarter of interview)}}{\text{prices (at first quarter 2009)}} * 100$.

[15] For clarity, we report here the equivalent amounts in sterling. We used the EUR/GBP exchange rate provided by the European Central Bank at 1st July 2010 that was equal to 0.82215. The reservation wage was equivalent to £866.5 for males and to £764.5 for females. The average reservation wage for the entire sample was equivalent to £827.

[16] In Table 2.2, we report measures of the shapes of the reservation wage distributions (standard deviation, variance, skewness and kurtosis) for both unemployed males and unemployed females, which also show a higher dispersion in the reservation wage distribution of women.

2.4 Method

2.4.1 The Determinants of Reservation Wages

The first model estimated in this chapter explores the determinants of reservation wages, based on a sample of 16,501 unemployed individuals observed over the period 2009 to 2011:

$$lrw_i = X_i\beta + \varepsilon_i \tag{2.1}$$

where lrw is the log monthly reservation wage, expressed in real terms; X_i is the vector of explanatory variables including a constant; β denotes the parameter vector; and ε_i is the error term. In accordance with the existing literature, the following control variables are included in X_i: gender, age, household structure (the number of children, the presence of a married or cohabiting partner, and the number of adults other than the partner living in the household), nationality, the level of education attained, job preferences with respect to commuting distance and temporary work, unemployment duration, job search intensity, previous work experience and a set of dummy variables for region and year controls. The set of explanatory variables is discussed in detail in Section 2.4.3.

Since the focus of this chapter is on gender differences, we perform our analysis in two steps. The first step is the estimation of a model based on all unemployed individuals in the sample, including a control for gender. In the second step, we assess whether the determinants of reservation wages vary by gender, and run separate regressions for the subsamples of 10,113 males and 6,388 females.

As mentioned above, the distribution of reservation wages of unemployed females differs - with a higher dispersion from the mean - compared to that of unemployed males (see Table 2.2). Such a difference has not been reported or investigated in existing studies for any of the OECD countries. To address this research gap, we explore the relationship

between the explanatory variables and the reservation wages at different quantiles of the distribution. To do this, we employ the quantile regression method introduced by Koenker and Basset (1978) as given by the following equation:

$$\hat{q}[lrw_i|X_i] = X_i\beta(\theta)\,, \qquad \text{for } \theta \in (0,1) \qquad (2.2)$$

where $\hat{q}(.)$ is the θ^{th} quantile of log reservation wages, *lrw*, conditional on the set of covariates, X_i; $\beta(\theta)$ denote the vector of parameters relating to the θ^{th} conditional quantile of the reservation wage distribution. We focus on three quantiles of the conditional distribution of reservation wages, 0.25, 0.5, and 0.75. As for the previous model, equation (2.2) was estimated focusing on all unemployed individuals and on males and females, separately.

The use of quantile regression has well-known advantages compared to using OLS (Angrist and Pischke, 2009). First, it is more robust against outliers in the dependent variable. Second, the use of OLS does not further understanding of the relationship between the covariates and changes in the distribution, given the assumption of constant effects of covariates. It is apparent that the effect of individual characteristics may differ along the reservation wage distribution reflecting, for example, different aspirations about wages before entering the labour market.

2.4.2 The Reservation Wage Gap

We firstly employ the Oaxaca (1973) decomposition, which is a standard method used to explain the difference in the means of an outcome variable between two groups, splitting the gap into an explained component and an unexplained component. The model is represented by the following equation:

$$\overline{lrw}^m - \overline{lrw}^f = \widehat{\beta^m}\,(\bar{X}^m - \bar{X}^f) + \bar{X}^f\,[\widehat{\beta^m} - \widehat{\beta^f}\,] \qquad (2.3)$$

where $\overline{lrw}$ is the mean of the log real monthly reservation wage related to the groups of males (m) and females (f); $\bar{X}^m$ and $\bar{X}^f$ are the sets of covariate averages observed for the two groups; $\widehat{\beta^m}$ and $\widehat{\beta^f}$ are the slope coefficients of the regression models estimated for males and females separately, including a constant.

The outcome variable of this model is the difference between the means of the log reservation wages of males and females. The first term on the right-side of the equation (2.3) is the 'explained' component of the differences in the mean, attributable to the differences in the observed characteristics between the two groups; whilst the second term is the 'unexplained' component resulting due to the difference in the return to the observed characteristics and it is usually interpreted as discrimination[17].

In the final step of the econometric analysis, we assess how individual characteristics contribute to explaining gender differences at different quantiles of the reservation wage distribution. This extends the work of Brown et al. (2011) who only examined the gap in the conditional means of males and females. For this purpose, we follow Melly (2005) who proposed an extension of the Oaxaca decomposition of means to the full distribution of the outcome variable. This method has not been used in the literature on reservation wages despite the fact that it provides a richer understanding of the data, allowing the measurement of decomposition of the gender gap at different quantiles of reservation wage distribution. From a practical point of view, the decomposition method consists of two main parts. In the first part, we use quantile regression to obtain an estimate of the conditional reservation wage distribution. Melly

[17] Although this is a common interpretation in studies focusing on the determinants of the gender wage gap, the unexplained component may not only reflect gender discrimination but also unmeasured productivity differences between women and men (Blau and Kahn, 2006). Furthermore, in the case of the reservation wage decomposition analysis, the unexplained component is more likely to reflect perceived discrimination rather than actual discrimination. The twofold decomposition assumes that discrimination is only directed against one of the two groups (women) and there is no discrimination towards men (Jann, 2008). This is in line with existing findings in the literature showing discrimination against women (e.g. Del Bono and Vuri, 2011).

(2005) shows that this can be done by integrating the conditional distribution of the dependent variable over the range of the covariates. The advantage of using this procedure is the possibility to simulate counterfactual distributions, which can be used to decompose differences in distribution.

The second part of this methodology consists of the decomposition of differences in distributions between unemployed females and unemployed males. Taking the median as a measure of the central tendency of a distribution, the following equation is estimated by quantile regression:

$$lrw_i^g = X_i^g \beta_i^g(0.5) + \varepsilon_i^g \tag{2.4}$$

where $\beta^g(0.5)$ is the coefficient vector of the median regression, for g= *m, f*. We can now isolate the effects of changes in characteristics, X, median coefficients, $\beta(0.5)$, and residuals, ε[18]. In particular, we estimate the counterfactual distribution of the reservation wages that would have prevailed for unemployed females if the distribution of characteristics (X) had been as it is for unemployed males $\hat{q}\left(\widehat{\beta^f},\ X^m\right)$. This is done by replacing the estimated parameters of unemployed males (X^m) with those of unemployed females (X^f).

To disentangle the effect of residuals from the effect of coefficients, it has to be noted that the θ[th] quantile of the residuals distribution conditional on X is consistently estimated by $X_i\left(\beta(\theta) - \beta(0.5)\right)$. Accordingly, Melly (2005) defines the following vector of coefficients as a measure for the residual component $\widehat{\beta^{m,rf}}(\theta) = \left[\widehat{\beta^m}(0.5) + \widehat{\beta^f}(\theta) - \widehat{\beta^f}(0.5)\right]$. This is used to estimate $\hat{q}\left(\widehat{\beta^{m,rf}}, X^m\right)$, i.e. the distribution that would

[18] Machado and Mata (2005) proposed a twofold decomposition method to decompose differences in the dependent variable into an explained and an unexplained component. However, the method proposed by Melly (2005) is more appropriate for this study as we are interested in examining whether unobservable factors are related to the gender reservation wage gap at different parts of the distribution.

have prevailed if the (median) coefficients were those of males but the residuals were distributed as in the female distribution. Therefore, the difference between $\hat{q}\left(\widehat{\beta^{m,rf}}, X^m\right)$, and $\hat{q}\left(\widehat{\beta^f},\ X^m\right)$ is due to changes in the coefficients since residuals and characteristics are kept unchanged. Finally, the difference between $\hat{q}\left(\widehat{\beta^m},\ X^m\right)$ and $\hat{q}\left(\widehat{\beta^{m,rf}}, X^m\right)$ is due to residuals.

The decomposition of reservation wages between females and males at the θ^{th} quantile can finally be expressed as follows:

$$\hat{q}\left(\widehat{\beta^m},\ X^m\right) - \hat{q}\left(\widehat{\beta^f},\ X^f\right) = \left\{\hat{q}\left(\widehat{\beta^{m,rf}},\ X^m\right) - \hat{q}\left(\widehat{\beta^f},\ X^m\right)\right\} + \left\{\hat{q}\left(\widehat{\beta^f},\ X^m\right) - \hat{q}\left(\widehat{\beta^f},\ X^f\right)\right\} + \left\{\hat{q}\left(\widehat{\beta^m},\ X^m\right) - \hat{q}\left(\widehat{\beta^{m,rf}},\ X^{fm}\right)\right\} \quad (2.5)$$

where $\hat{q}(.)$ is the θ^{th} quantile of log reservation wages *lrw* conditional on the set of covariates X, either for the groups of males or females; $\hat{\beta}$ is the θ^{th} quantile regression coefficient evaluated at the median; and $\bar{X}$ is the vector of covariate averages. The first term denotes the effects of changes in the median coefficients. The second term represents the gender differential at the θ^{th} quantile due to characteristics (or endowment) differentials. The third term represents the effect of differences in the residuals.

2.4.3 Explanatory Variables

The choice of explanatory variables is based on the existing literature. For example, the reservation wage has been found to be related to personal characteristics, such as gender, age, nationality, and education (Jones, 1988; Hui, 1991; Haurin and Sridhar, 2003; Brown et al. 2010). Hence, we control for gender and age, where age is included as a continuous variable.

To control for nationality, we use two dummy variables: 'foreign-eu' which refers to individuals whose nationality is not Italian but from a country within the European

Union (EU); and ‘foreign-extraeu’ which refers to individuals from a country outside the EU.

A set of three dummy variables is used to control for the highest level of education attained. First, ‘low education’ (the reference category) denotes individuals with no formal education, primary education (usually attained at the age of 10) or a junior high school certification (usually between ages 11 and 14); this category is equivalent to the Key Stage 3 level of the UK system. Second, the variable ‘secondary school’ refers to people whose highest level of education attained is either a vocational diploma (3 years after junior high school) or a high school diploma (usually attained at the age of 19), comparable to the Key Stage 5 of the UK system. Third, ‘High Education’ comprises individuals with a university degree (Bachelor, Masters or PhD).

In line with Sestito and Viviano (2011), we include a set of five dummy variables to account for regional differences, following the official division into macro-areas used by Eurostat[19]. The ‘North-West’ comprises the regions of Piemonte, Lombardia, Valle d'Aosta and Liguria. The ‘North-East’ includes the regions of Trentino Alto Adige, Veneto, Friuli Venezia Giulia, and Emilia Romagna. The ‘Centre’ comprises the regions of Toscana, Umbria, Marche, Lazio, Abruzzo and Molise. The ‘South’ includes the regions of Campania, Basilicata, Puglia, and Calabria. Finally, the ‘Islands’ refers to Sicilia and Sardegna.

As explained above, household composition may affect reservation wages (Prasad, 2003; Brown et al., 2011). Hence, the variable ‘own children’ is included to account for the number of dependent children aged between 0 and 16 years old. In related literature, the presence of co-resident adults was found to affect the participation of women in the labour force. In particular, the presence of other adults in the household

[19] In particular, we refer to the five first-level NUTS (Nomenclature of Territorial Units for Statistics) regions, that is, the administrative division of the country used by the European Union.

may have an ambiguous effect on the LFP of a woman, depending on whether such individuals provide informal help with tasks that are usually carried out by women - such as household chores and care for other relatives – or whether they require assistance themselves (Pagani and Marenzi, 2008). To shed further light on this effect, we investigate whether a link exists between other cohabitants in the household and reservation wages. In particular, we control for the number of relatives in the household, excluding the partner and the dependent children.

The reservation wage may also depend on the financial resources available within the family, such as the partner's and other relatives' earnings (Prasad, 2003). However, since the LFS does not provide information on household income, we use the partner's employment status and the number of other employed individuals in the household as a proxy for such financial resources. The partner's employment status is categorized using the following set of dummy variables: 'employed partner' denotes individuals with either an employed or self-employed partner; 'unemployed partner' refers to individuals with an unemployed or inactive partner; 'no partner' is the reference category comprising those unemployed individuals without a partner living in the household.

In keeping with Brown and Taylor (2015), we construct an index of job search intensity that indicates which of the following job-search actions were undertaken by the individuals in the four weeks prior to the interview: contacted a public job agency; applied to participate in an open competition exam (this relates to public sector employment); examined job vacancies in the newspapers; put advertisements in newspapers or responded to advertisements; applied for/sent CV for a job in a private company; were recommended by friends or relatives to potential employers; used the internet; contacted

a private job agency; undertook other actions. These outcomes were used to create the 'job search index' that ranges from 0 to 9, corresponding to the above nine activities[20].

Previous studies by Lancaster and Chesher (1983) and Prasad (2003) have found that the reservation wage depends on the level of unemployment benefit. As explained in more detail in Appendix A, in Italy only workers who have lost their jobs may receive unemployment benefit and, in most cases, the duration of such benefit is only one year. Hence, the control for unemployment benefit may be correlated with other explanatory variables such as age, unemployment duration and not having previous job experience, which are included in the model. To avoid multicollinearity issues, we use a set of three variables that account for unemployment benefit ineligibility. The first dummy variable 'never worked' denotes individuals without previous work experience, following van Ophem et al. (2011). The second dummy variable 'long term unemployment' indicates whether an individual has been looking for job for more than 12 months. Reservation wages are expected to decline with job search duration in line with the findings from Hui (1991) and Brown and Taylor (2013). The third dummy variable 're-enter' denotes individuals with previous job experience who were inactive before they started to look for a job. As a robustness check, we have also estimated another specification with a control indicating receipt of 'unemployment benefit', which is a dummy variable taking the value of one if the individual received unemployment benefit[21].

Two sets of dummy variables are used to control for job preferences, following Sestito and Viviano (2011). The variable 'looking for a permanent job' indicates whether job-seekers were exclusively looking for a permanent job. A set of four controls is used to indicate whether an individual expressed a preference for a job anywhere in Italy or in

[20] The distribution of the number of job search activities was the following: 0.61% of individuals did not undertake any job search activity in the last 4 weeks, 13.16% undertook 1 job search activity, 18.84% undertook two job search activities, 20.33% undertook three job search activities, 19.33% undertook four job search activities, 15.09% undertook five job search activities, 9.05% undertook six different job search activities, and 3.59 undertook more than seven job search activities.

[21] The results for these models are reported in Appendix B.

Europe (‘Italy commuting’, ‘Europe commuting’), within a daily reachable distance (‘close commuting’), or did not want to commute outside of the town of residence (‘no commuting’). Finally, a set of dummy variables ‘2009’, ‘2010’ and ‘2011’ is included to control for the year of interview.

2.5 Summary Statistics

The summary statistics for the explanatory variables are given in Table 2.4. These are reported for the entire sample of 16,501 unemployed individuals, and separately for the sub-samples of 10,113 males and 6,388 females. The last column of Table 2.4 provides a t-test for the difference in the means of the variables between unemployed males and unemployed females. The average age of all unemployed individuals is 34.5 and the average of unemployed women is 2 years younger than that of unemployed men, whose average age is 35.3.

The percentage of individuals with Italian citizenship is 82.6%, while 17.3% were born abroad. Among these born abroad, 4.6% have EU citizenship and 12.7% have citizenship from a country outside the EU. In the sample of unemployed males, 3.5% are non-Italian EU citizens and 12.7% have non-EU nationality, whilst 6.5% of unemployed females are from another EU country and 11.63% come from outside the EU.

The distribution of education for all unemployed individuals is as follows: 48.9% are low educated, 40.5% have a high school diploma and 10.2% have attained a university degree. Unemployed females appear to be more educated relative to their unemployed male counterparts. In fact, the proportion of unemployed men with low education is 55%, against 39.2% for unemployed women. 38.3% of unemployed males and 44.1% of unemployed females have a high school diploma, while the proportion of individuals with a university degree is 6.7% among unemployed males and 16.7% among unemployed females. This may reflect low rates of labour force participation among low educated females (which is further explored in Chapter 3).

The geographic distribution of the sample population is as follows: 25.4% of unemployed individuals live in the North-West, 15.5% in the North-East, 14.2% in Central Italy, 28.3% in the South, and 16.6% on the Islands. These figures reflect the different unemployment rates among these regions. For example, in the period from 2009 to 2011 the unemployment rate in the North-East varied between 4.6% and 5.4%, and between 12.5% and 13.5% in the South (Istat, 2017a). The percentage of men living in the South and on the Islands is also higher than for unemployed females, while there is the opposite pattern in the northern regions. The proportion of men (women) living in the South and on the Island is 15.1% (17.6%) and 29.4% (26.7%). Among unemployed men (women) 24.6% (26.7%) and 15% (16.23%) of them live in the North-West and North-East, whereas 13.4% (15.3%) of unemployed men (women) live in Central Italy. These figures potentially reflect lower job opportunities in southern regions for females, along with the lower female labour force participation (Istat, 2017a).

Both samples of unemployed males and females have, on average, 0.33 dependent children[22]. The average number of other co-habiting relatives is 1.5 for both unemployed males and unemployed females. More than half of the sample of unemployed individuals are single but unemployed women are more likely to be in this category, at 55.7%, compared to 52.3% for unemployed men. 17.5% of unemployed individuals have an employed partner in the household and 20.6% are living with a non-employed partner. These figures differ substantially by gender: for example, the percentage of unemployed men with a non-working partner is 23.1% compared to 8.6% for women. 26.3% of unemployed women live with an employed partner, whereas only 16.9% of unemployed men have a working partner.

[22] The distribution of children in the sample of unemployed females (males) is the following: 79.1% (78%) of unemployed women (men) have no dependent children, 13.9% (13%) have one dependent child in the household, 6.1% (6.9%) have two children in the household, and 0.9% (2.1%) have three or more children in the household.

Regarding job preferences, 12.6% of unemployed individuals do not want to commute, 67.1% are willing to commute within a daily commutable distance, and the remaining 20.2% indicate that they would have accepted commuting anywhere in Italy or in Europe. Considering gender differences, there is a higher percentage of males willing to commute outside their own region or country, whereas a higher percentage of females choose to work within a daily reachable area. Finally, only 5.32% of males and 3.8% of females are only looking for a permanent job.

The proportion of unemployed individuals without previous work experience is 24.3%. This percentage differed significantly by gender, being 19.9% for unemployed males and 31.3% for unemployed females. Consequently, only 12.4% of unemployed men and 7.5% of unemployed women are in receipt of unemployment benefit at the interview date.

Regarding unemployment duration and job search, individuals were unemployed, on average, for 20.6 months and the duration for unemployed females was 2.4 months longer than that for unemployed males. The average number of job search activities is 3.4 for both men and women. Finally, the observations are distributed almost equally across the three waves: 34.5% were interviewed in 2009, 33.9% and 31.6% were interviewed in 2010 and 2011, respectively.

2.6 Results

The models of the determinants of the reservation wages include explanatory variables which are selected following the existing literature, as explained in Section 2.4.3. However, it is important to acknowledge that all of the results presented in this chapter represent associations rather than causal relationships.

2.6.1 The Determinants of Reservation Wages

The results for the OLS model estimating the determinants of reservation wages are reported in Table 2.5 for the entire sample of unemployed individuals (column 1) and for

the subsamples of unemployed females and males (columns 2 and 3, respectively). Table B.2 of Appendix B reports the analogous results for the robustness-check model including a control for unemployment benefit. As explained in Section 2.4.3, unemployment benefit was excluded from the main model due to potential collinearity with other explanatory variables such as age, unemployment duration, and work experience[23].

In line with other studies in the literature (e.g. Hui, 1991; Prasad, 2003), being female is associated with a decrease in the reservation wage by 11.4 percentage points (pp). For both samples of unemployed men and women, we find a positive relationship between age and reservation wages, with similar magnitude (1.5pp) and at a decreasing rate. The reservation wage of unemployed individuals from an EU country (non-EU country) is 5.7pp (6.8pp) lower than the reservation wage of those with Italian nationality. For foreign individuals coming from an EU country, this association is similar between men and women. In contrast, coming from a non-EU country is associated with a decrease in the reservation wage by 3pp (8.5pp) for females (males). In line with previous findings in the existing literature (see e.g. Haurin and Sridhar, 2003), reservation wages monotonically increase with the level of education and this association is stronger for females. Having a high school diploma is related to an increase in the reservation wage by 4.3pp (3.7pp) for females (males), whereas having a university degree is associated with an increase in reservation wages by 14.6pp (9.7pp) for women (men).

The region with the highest unemployment rate in Italy, the South (Istat, 2017a), is also the area where reservation wages are the lowest. In fact, unemployed individuals living on the Islands and in Central Italy have a reservation wage of 2.4pp and 1.9pp higher, respectively, than those living in the South. Living in richer areas such as the North-West and the North-East is associated with an increase in the reservation wage by

[23] The results of the robustness check relating to the unemployment benefit variable are discussed in this section (Section 2.6.1). The results relating to the other explanatory variables are in line with those from the main model (see Table B.2 of Appendix B).

5.7pp and 7.4pp, respectively. Additionally, these differences appear to be larger for unemployed females, possibly reflecting gender gaps in regional unemployment rates. For example, in 2011, the difference in the unemployment rate between the South and the North was 8.8% for women and 4.4% for men (Istat, 2017a).

In the sample of unemployed individuals including both men and women, having a dependent child is associated with a 1.4pp increase in the reservation wage, whereas a statistically insignificant relationship is found for other cohabitant adults. In addition, having an employed (unemployed) partner is associated with an increase in reservation wages of 2.3pp (5.2pp). These results vary considerably between unemployed men and unemployed women. Having a dependent child is associated with a 1.7pp increase in the reservation wage for unemployed men, while a statistically insignificant relationship is found for females. This result is in line with Prasad (2003). The presence of additional adults in the household is unrelated to the reservation wage of men but associated with a 1.1pp decrease in the reservation wage of females. A related study by Pagani and Marenzi (2008) investigated the link between co-resident relatives and the labour force participation of Italian females. They found that the presence of adult relatives in the household increases a woman's probability of being employed, which may reflect the possibility that the adult relatives provide informal care and help with domestic activities. Our results not only support this finding but also shed further light on the link between co-resident relatives and the labour force participation of females, suggesting that household structure may affect labour market participation indirectly via reservation wages. Having a partner is found to be associated with an increase in the reservation wage of unemployed men. In fact, keeping everything else constant, males who cohabit with an employed (an unemployed) partner have a reservation wage 4.7pp (6.4pp) higher than single individuals. The association between reservation wages and the presence of a partner in the household is statistically insignificant for unemployed females.

To summarise the results on household structure, the findings suggest that the presence of a co-resident partner and dependent children only influence the reservation wages of males, whereas the reservation wages of unemployed females are only related to the presence of other adults in the household. A possible explanation for such a discrepancy may stem from cultural reasons. Italian families have a well-defined allocation of household labour, with men being the main bread winners and women dedicating more time to domestic activities such as housework and the care of relatives (this is discussed in more detail in Section 3.1, Chapter 3).

Regarding job preferences for all unemployed individuals, we find that reservation wages increase with expressing a preference for a permanent contract and the commuting distance. Interestingly, these associations are sizeable, and similar in magnitude to those found for education for both samples of unemployed males and unemployed females. For example, looking for a permanent contract is associated with an increase in the reservation wage of 8.6pp (12pp) for unemployed males (females) - comparable with the increases in the reservation wage associated with university education.

In the sample of unemployed individuals, a positive relationship is found between commuting distance and reservation wages; this is consistent with Sestito and Viviano (2011). In particular, individuals looking for a job within a daily reachable distance have a reservation wage 4.2pp higher than those who reported a 'no-commuting' preference. This magnitude is similar to the increase associated with having high school education. Being willing to commute anywhere in Italy or in Europe leads to increases in the reservation wage by 14.4pp and 18.7pp, respectively – larger than the effect associated with university education. The magnitudes of these associations differ by gender: the preference for 'any commuting in Italy' is associated with an increase in the reservation wage by 12.8pp (17pp) for unemployed males (females); 'any commuting in Europe' is

related to an increase in the reservation wage by 20.2pp (13.2pp) for unemployed males (females)[24].

Variables capturing unemployment duration and ineligibility for unemployment benefit are related to the reservation wage of unemployed males but unrelated to the reservation wage of unemployed females. The dummy variable 're-enter', indicating whether individuals have previous job experience but have spent a period out of the labour market before looking for a new job, is associated with a fall in the reservation wage of males by 1.3pp. Consistent with the findings of Hui (1991) and van Ophem et al. (2011), having no previous working experience and long-term unemployment are associated with 2.1pp and 4.5pp, respectively, decreases in the reservation wage for males. In line with Brown and Taylor (2013), a positive link between the job search index and reservation wages is found. In addition, the association is stronger for females. Finally, receiving unemployment benefits is positively related to the reservation wages of both unemployed males (5.6 pp) and unemployed females (5.9 pp) (see Table B.1 in Appendix B).

In line with the increasing trend in the unemployment rates for both males and females (Istat, 2017a), we found that being interviewed in 2011 is related to a decrease in the reservation wage by 2.8pp (3.9pp) for males (females), respectively. In contrast, there is no statistical difference between 2009 and 2010.

2.6.2 Quantile Regression

In this section, we present the estimates for model (2), evaluated at the 25th 50th and 75th percentiles of the conditional distribution of reservation wages. To explore gender differences, we focus on three samples: all unemployed individuals (see Table 2.6, column 1-3), unemployed females (Table 2.6, columns 4-6) and unemployed males

[24] The reservation wages of unemployed females do not increase monotonically with the commuting distance, as one might expect. This might be because the subgroup of unemployed women looking for a job anywhere in Europe is a small, arguably a selected subsample, only accounting for 294 observations.

(Table 2.6, columns 7-9)[25]. We also compare the results from the quantile regression analysis with those obtained using OLS. Specifically, we present the estimated effects for each quantile of the reservation wage distribution (along with 95% confidence band around the estimates) for some key variables of interest namely gender, household composition, and job preferences (se Figures 2.2 - 2.4 in this section). Additionally, in Table B.2, we report the results for the model including control for receiving unemployment benefit.

Previous studies have found that gender has a negative effect on reservation wages, assuming this effect to be constant across the conditional distribution of reservation wages (Hui, 1991; Haurin and Sridhar, 2003; Brown et al. 2011). Using quantile regression analysis, we find that the gender gap is relatively large at the lower part of the reservation wage distribution. Our findings show that the difference between male and female reservation wages is 12.1pp at the 25th percentile, 8.6pp at the 50th percentile, and 8.9pp at the 75th percentile.

For both males and females, the association between age and reservation wages is positive but relatively small at the top of the reservation wage distribution. Reservation wages are inversely related to being either a non-Italian EU citizen or a non-EU citizen, and this relationship does not change considerably across the reservation wage distribution. Focusing on gender differences, being non-European shifts the reservation wage distribution of males to the left by more than that of females. This indicates that the gender reservation wage gap for unemployed non-Europeans, holding all else constant, might be lower than for those with Italian nationality.

For all unemployed individuals, the association between having a high school diploma and reservation wages is positive and constant across the entire distribution.

[25] The results for receiving unemployment benefit are discussed in the present section, whereas the results for the other control variables are only presented in Table B.2, as they are in line with those obtained in the main model specification.

Having attained a university degree is related to an increase in the reservation wage of 9pp at the 25th and 50th percentiles, and 11.6pp at the 75th percentile. These results vary by gender. For unemployed women (men), the association between high school and education is relatively large (small) at the median. The association between having a university degree and the reservation wages of unemployed males increases monotonically along the reservation wage distribution. For unemployed females, having attained a university degree is associated with a 12.4pp increase in the reservation wage at the 25th percentile, with a 10.5pp increase in the reservation wage at the 50th percentile, and with a 15.5pp increase in the reservation wage at the 75th percentile.

Regarding regions, the results can be interpreted in terms of geographical differences in reservation wages between the southern and other regions of Italy (at the different quantiles). In the sample of all unemployed individuals, positive regional gaps between the southern and the northern regions are found to be persistent across the reservation wage distribution, except for a statistically insignificant coefficient for the North-West at the 75th percentile. Additionally, these differences are decreasing along the distribution, denoting a higher dispersion of reservation wages within the South compared to both the North-East and the North-West. Finally, the associations between reservation wages and other regions (Central Italy and the Islands) are found to be positive at the 25th percentile but negative at the bottom of the reservation wage distribution. For unemployed females, regional differences in reservation wages between the South and other regions are relatively large at the 25^{th} percentile, suggesting that unemployed females with low reservation wages are more likely to live in the South. For unemployed males, a similar regional pattern is not apparent. These results might indicate that gender segregation in low paid jobs happens to a larger extent in the South, the least industrialised area of the country and a region with less financial resources invested in childcare services (see Chapter 3). Female occupational segregation is more likely to happen in areas or

countries where the LFP of females is generally low due to less job opportunities, and there is a lack of public services to reconcile work and family (de la Rica et al., 2008).

Among all unemployed individuals, having additional adults in the household is associated with a 3pp decrease in reservation wages at the top of the reservation wage distribution, but is unrelated to the reservation wage of unemployed individuals at the 25th and 50th percentiles. However, these result do not appear to be statistically different from those obtained with OLS (see Figure 2.2)[26]. Different patterns are found between unemployed men and unemployed women. For unemployed males, the association between cohabiting relatives and reservation wages is positive (6pp) at the 25th and 50th percentiles and negative (-4pp) at the 75th percentile. This pattern serves to explain the statistically insignificant result found with the standard OLS approach (see Figure 2.4). For unemployed females, having an additional adult in the household is negatively associated with the reservation wages of females at the 25th and 50th percentiles, but statistically insignificant at the 75th percentile. In addition, Figure 2.3 shows that the effect of having an additional adult in the household evaluated at the 75th percentile is relatively large relative to the OLS estimate, whereas no difference is found between the OLS estimate and the effects of 'other adults' evaluated at the 25th and 50th percentiles of the reservation wage distribution.

In line with the OLS findings, having children is unrelated to the reservation wages of unemployed females at all the quantiles evaluated (see Figure 2.3). In contrast, the association between having children and the reservation wage for men is positive but relatively low at the 25th percentile of the reservation wage distribution. At the 50th and 75th percentiles, the results do not differ from those obtained with OLS (Figure 2.4).

[26] The dotted horizontal line represents the OLS estimate for the selected covariates. The coefficients of the quantile regression analysis are statistically different from the OLS estimates when the dotted line is not within the confidence band, evaluated for the quantiles of interest.

The reservation wage is unrelated to having an employed or unemployed partner for females, in line with the OLS results (Table 2.5, column 2). For men, having an employed partner is associated with an increase in the reservation wage between 2.3pp and 4.1pp across the three different quantiles, while the increase is between 3.8 and 5.5pp if the cohabiting partner is unemployed.

Among unemployed individuals (columns 1-3), expressing a preference for permanent employment is positively related to reservation wages with a similar magnitude at all quantiles analysed (Figure 2.2). A similar pattern is found for unemployed men (Figure 2.4). Among unemployed women, the association between having a preference for permanent employment and reservation wages is higher at the 75th percentile (Figure 2.3). In fact, 'only permanent' increases the reservation wage of females by 7.4pp at the bottom of the distribution and by 14.3pp at the top of the distribution (Table 2.6, columns 4-6).

Regarding commuting preferences, the results can be interpreted as the difference between the three commuting variables (close commuting, commuting in Italy, commuting in Europe) and the base category ('no commuting') at the 25th, 50th, and 75th percentiles. Positive associations between reservation wages and all commuting variables are found across the entire distribution of reservation wages of the unemployed (columns 1-3). Specifically, the difference in reservation wages between those individuals who prefer 'close commuting' and those who preferred the 'no commuting' option is 3.7pp at the 25th percentile and 1.5pp at the 75^{th} percentile. The coefficients of both 'anycommunting_Italy' and 'anycommunting_Europe' are higher at the top of the reservation wage distribution, which may be consistent with the hypothesis that individuals at the top and those at the bottom of the reservation wage distribution have different preferences with respect to commuting distance (Figure 2.3).

With respect to the job preferences of unemployed females, being willing to commute to a daily reachable distance has a relatively large association with reservation wages at the 25th percentile of the distribution. In contrast, looking for a permanent job and being willing to commute abroad have (positive) relatively large effects at the 75th percentile of the reservation wage distribution (see Figure 2.3). This implies that unemployed females located at the bottom of the reservation wage distribution have different preferences over nonwage characteristics compared to those at the top of the distribution. This heterogeneity captured by quantile regression analysis suggests that unemployed females at different parts of the reservation wage distribution target different jobs, in line with the hypothesis put forward in Section 2.1.

In line with the OLS results, having no experience is unrelated to the reservation wages of women across the entire reservation wage distribution. In contrast, the variable 'never worked' is negatively related to the reservation wages of men but the association at the 75^{th} percentile (Table 2.5, column 4-6) is statistically insignificant.

The results related to the variables capturing long term unemployment and re-entering the labour market are in line with the OLS results, and differ considerably by gender. In particular, long term unemployment appears to be unrelated to the reservation wages of women but negatively related to the reservation wages of men, with a constant relationship in terms of magnitude across the distribution. For both men and women, the association between the variable 're-enter' and reservation wages is not statistically significant. In line with expectations, the relationship between receiving unemployment benefit and reservation wages (see Table B.3 in Appendix B) is positive and also constant in terms of magnitude across the reservation wage distribution (between 4.4pp and 4.9pp).

We find a negative difference between the reservation wages of unemployed individuals interviewed in 2011 and those interviewed in 2009. Additionally, this difference is relatively large at the bottom of the reservation wage distribution for both

women and men. Finally, there is no statistically significant difference in reservation wages between 2009 and 2010. These results may reflect the prolonged effects of the 2008 financial crisis in the Italian economy as unemployed individuals may have revised their wage expectations as a consequence of the drop in real wages between 2009 and 2011 (OECD, 2017c).

To conclude, the results using quantile regression reveal some differences compared to findings obtained with OLS. For example, conditional on other observables, the reservation wage gap between unemployed males and unemployed females is highest at the bottom of the reservation wage distribution (Figure 2.3). In the next subsections, we perform decomposition analysis of the gender reservation wage gap to investigate which factors are responsible for the relatively large gap at the bottom of the distribution.

Figure 2. 2 - Associations between selected covariates and reservation wages across the reservation wage distribution; sample of all unemployed individuals

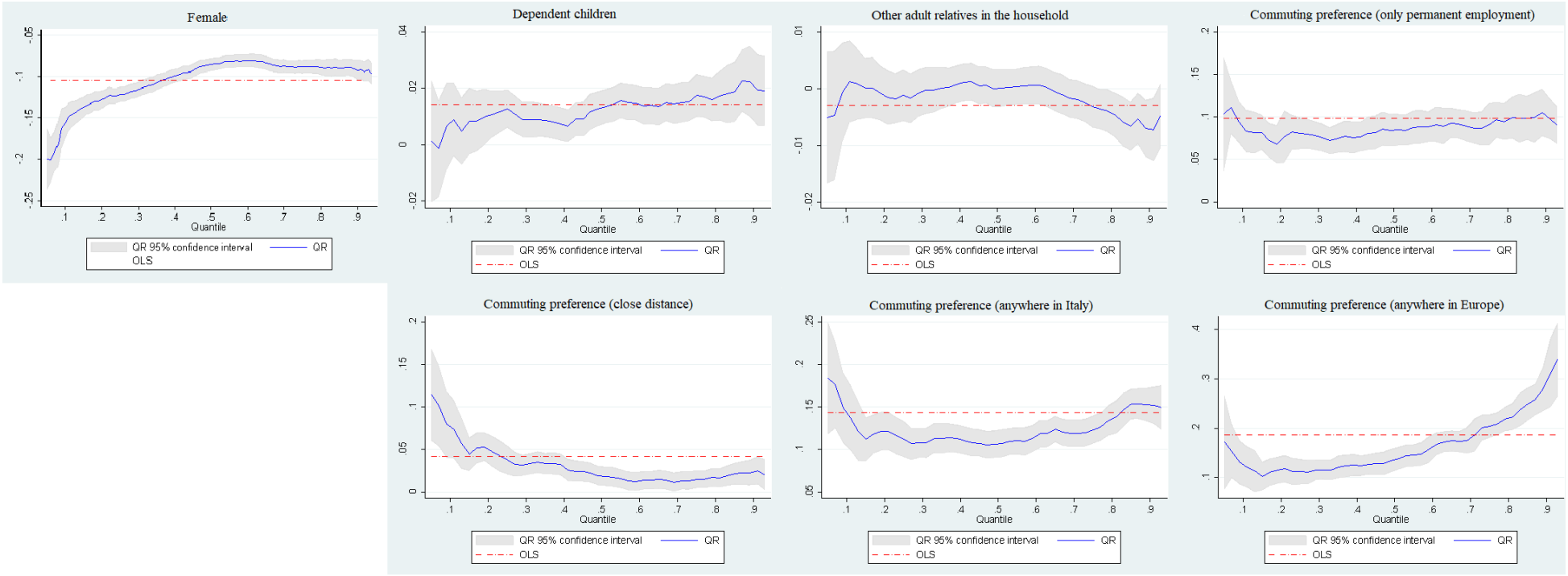


Figure 2. 3 - Associations between selected covariates and reservation wages across the reservation wage distribution; sample of unemployed females

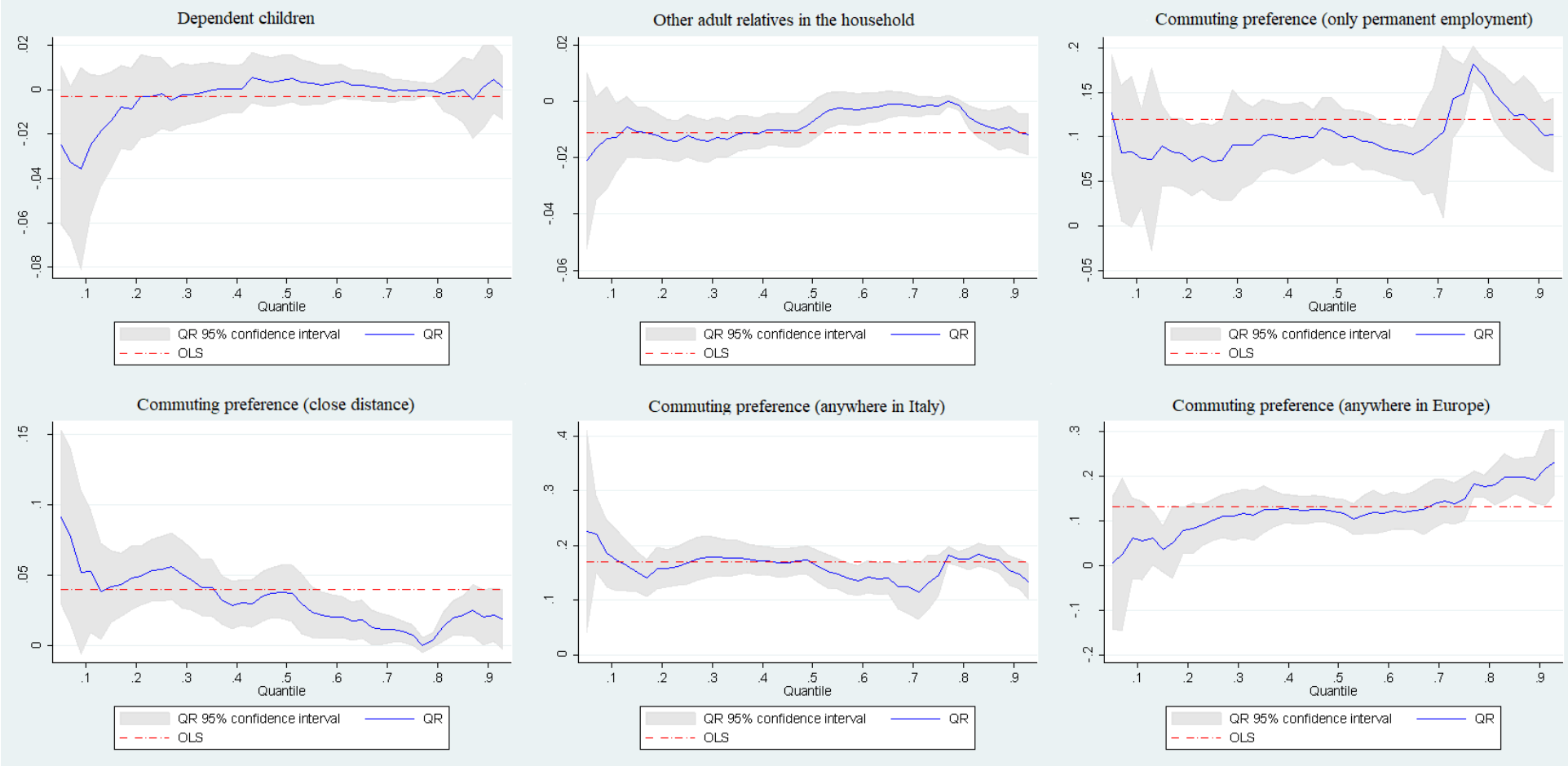
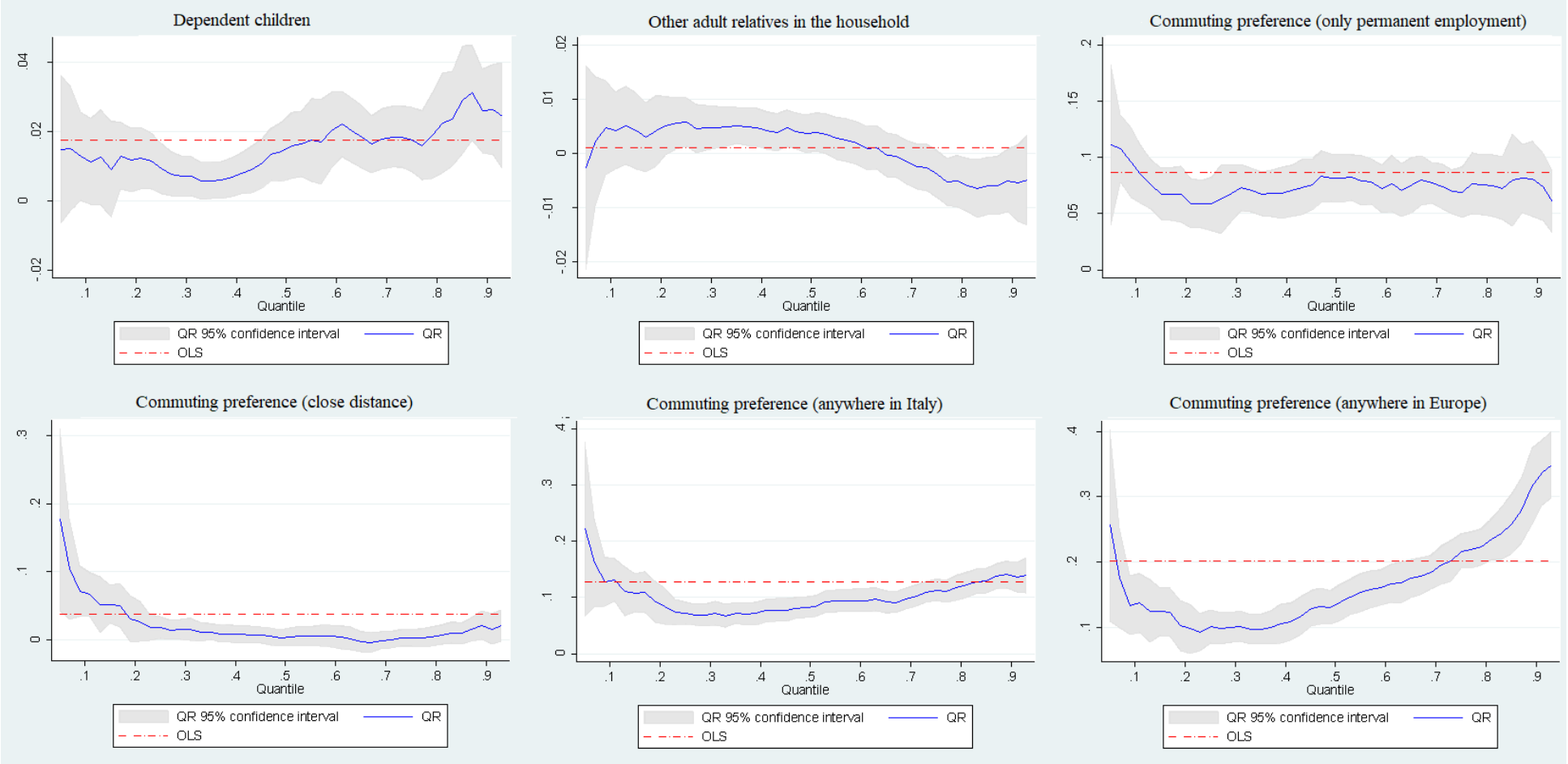


Figure 2. 4 - Associations between selected covariates and reservation wages across the reservation wage distribution; sample of unemployed males



2.6.3 Decomposition of Differences at the Mean

The results from the decomposition of the gender reservation wage gap using the method by Oaxaca (1973) are reported in Table 2.7. Table B.3 of Appendix B also reports the results for the robustness-check model where a control for receiving unemployment benefit is included instead of the labour market controls which determine unemployment benefit eligibility. Table 2.7 shows that the portion of the reservation wage gap explained by different characteristics is equal to 15.5%. This component can alternatively be seen as the expected change in the females' mean outcome if females had the same endowments levels as males. The unexplained component accounts for 84.5% of the gap, denoting the expected change in the females' mean outcome if females had the same coefficients as males.

The effects of the different covariates are presented in Table 2.7 in the following subgroups: age, region of residence, nationality, education, household composition, job preference, labour market factors, and year of interview[27]. The results indicate that 4.6% of the gap is explained by the younger age of unemployed women, while different endowments in terms of region and nationality account for a small reduction (-0.8%) in the reservation wage gap. The unexplained components related to both 'region' and 'nationality' are negative and statistically significant, meaning that the gender reservation wage gap would be higher if unemployed females have the same coefficients as unemployed males. Table 2.5 shows that the differences in the reservation wages across regions and nationalities are dissimilar within the samples of unemployed males and unemployed females.

Differences in education account for a reduction in the gender reservation wage gap of 9.3%, in line with unemployed females being more educated than their male

[27] To make the results comparable, we express the explained and unexplained components related to the subgroups of variables as a percentage of the total reservation wage gap (see Table 2.7). See also Table 2.7 for detail of what is included in each subgroup.

counterparts (see Table 2.4). In addition, the unexplained component indicates that the reservation wage gap would increase if unemployed women have the same education coefficients as unemployed men. In fact, our OLS results show that the link between education and reservation wages is stronger for unemployed women (see Table 2.5, column 2-3) than for unemployed men. This is in line with females having potentially higher returns to education in the labour market compared to males (e.g. Brunello, 2000; Trostel et al., 2002).

4.6% of the gender reservation wage gap is explained by differences in household composition between males and females. Such differences are shown in Table 2.4 which indicates that, relative to unemployed men, unemployed women have fewer children and are more likely to live with an employed rather than unemployed partner. The unexplained component associated with household composition is equal to 35.7% of the gap. This result is consistent with the OLS findings (Table 2.5), which show that household variables such as having a cohabiting partner and dependent children are linked to the reservation wages of males but unrelated to the reservation wages of females. If such positive returns existed for women then their reservation wages would have been higher. As discussed in the previous section, this may be due to cultural factors such as men usually being the main bread winners in Italian families, while women generally take responsibility for domestic activities. This result might also reflect different wage expectations between males and females. In fact, there is evidence that men with children earn more than their female counterparts because having a child usually forces women to interrupt their career, and this penalizes them in terms of work experience (Addabbo and Favaro, 2011).

Different job preferences between males and females account for 11.6% of the gender reservation wage gap. In fact, a larger portion of unemployed men than unemployed female have preferences for commuting long distances and permanent

employment (Table 2.4). Hence, if women were less restrictive with respect to commuting preferences their reservation wages would have been higher. In related literature, Daymont and Andrisani (1984) found that job preferences explain a large portion of the earnings gap between men and women in the US. Bratti et al (2005) showed that job attributes such as a temporary versus a permanent contract, or working in the public versus the private sector, are significantly related to the labour market participation of Italian mothers. We contribute to this literature by showing that the gender reservation wage gap in Italy may also reflect different job preferences between unemployed males and unemployed females.

Different characteristics in terms of labour market experience between unemployed males and unemployed females account for a small percentage (3.9%) of the reservation wage gender gap. In contrast, the unexplained component associated with the controls for labour market experience account for a large reduction (32.6%) in the reservation wage gap; this means that if unemployed women had the same coefficients as unemployed men the gender gap would be even higher. This may also suggest that the perceived wage penalty for not having any work experience or being unemployed for a long period is higher for women. Finally, the explained and unexplained components associated with years of interview are statistically insignificant.

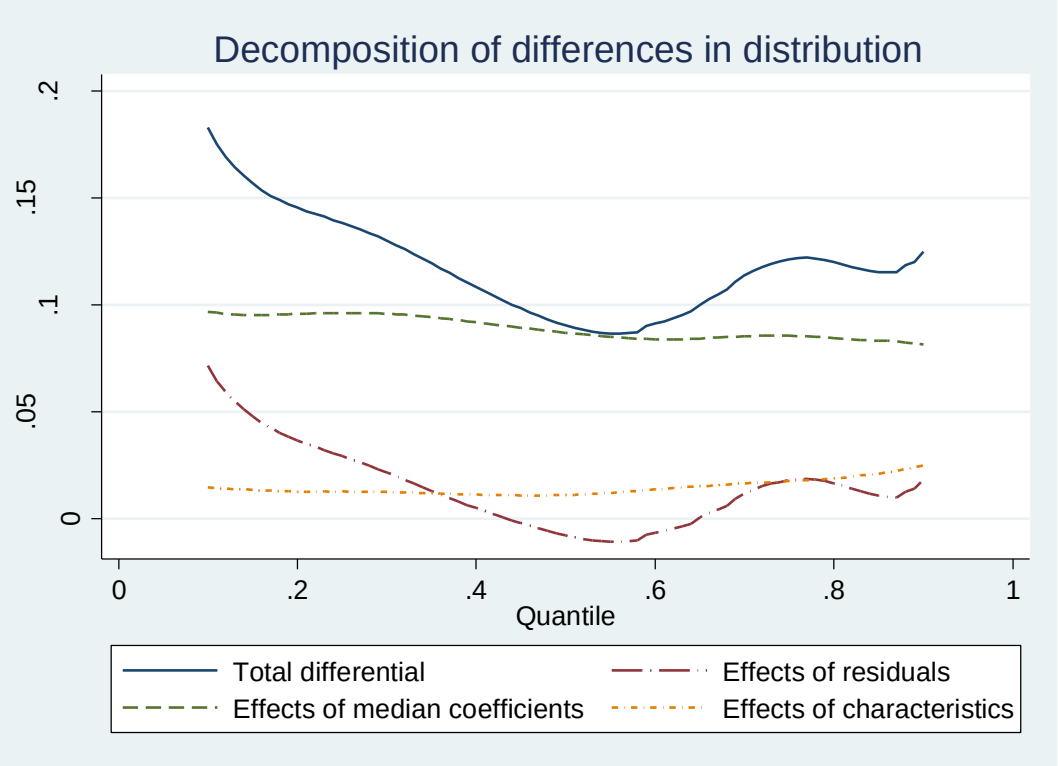
To conclude, the fact that unemployed women have higher levels of education compared to unemployed men is the only factor that reduces the gender reservation wage gap. In contrast, household structure and job preferences are the most contributing factors accounting for 16% of the differential. This finding contributes to the findings from the existing study of Brown et al. (2011) who explored the determinants of the gender reservation wage gap in the UK, but did not consider the possibility that differences in reservation wages may arise as a consequence of different preferences over job characteristics. Overall, 84.5% of the gap remaines unexplained suggesting that residual

factors may play an important role in explaining differences in the reservation wages between the two groups. In the next section, we decompose the gender gap at different quantiles to further investigate the origin of these factors.

2.6.4 Decomposition Using Quantile Regression

To decompose the gender reservation wage gap across the entire distribution of reservation wages, we use the method proposed by Melly (2005). This method is based on the estimation of a counterfactual distribution for unemployed females, as explained in Section 2.4.2. Comparing the reservation wage distribution of males with its female counterfactual, the dependent variable can be decomposed into three components: the effect of characteristics; the effect of coefficients; and a residual effect. Figure 2.5 plots the results of the decomposition at the 99 different quantiles, which are located on the horizontal axis[28]. Estimates for three selected percentiles (25th, 50th, and 75th) are also reported in Table 2.8.

Figure 2. 5 – Decomposition of reservation wages using the Melly (2005) estimator



[28] Following Melly (2005), we compute standard errors by bootstrapping the results 100 times.

The total difference in reservation wages between unemployed females and unemployed males (as shown by the solid blue line) is positive across the entire distribution, meaning that the reservation wages of unemployed males are persistently higher than that for unemployed females. The gender reservation wage gap is larger at both the lower and the upper ends of the reservation wage distribution. In fact, the difference in reservation wages between unemployed females and unemployed males is 14pp at the 25th percentile, 9pp at the 50th percentile and 12.1pp at the 75th percentile (see Table 2.8).

The portion of the total gap explained by different characteristics (as depicted by the orange line) is close to zero and almost constant across the entire distribution of reservation wages. Hence, this effect is well approximated by the Oaxaca decomposition. The effect of the median coefficients (as shown by the green line) is large but fairly constant, varying from 0.86 to 0.95 depending on the percentile analysed (see Table 2.8). This means that the distribution of reservation wages of unemployed females would be shifted to the right if they had the same coefficients as unemployed males. Finally, the large increase in the reservation wage gap at the lower part of the distribution is mainly due to the incidence of residuals. For example, at the 25th percentile the effect of the residuals accounts for almost one quarter of the entire gap.

To conclude, our decomposition analysis shows that the components of the gender reservation wage gap related to different characteristics and different coefficients between the two groups are constant across the reservation wage distribution, and are therefore well captured by the Oaxaca decomposition presented in the previous section. However, using the method of Melly (2005) we show that there is a residual effect responsible for the large increase in the gender reservation wage gap at the bottom of the distribution. Since this effect is by definition unrelated to differences in both the coefficients and

characteristics between the two groups, it must depend on factors that are related to being at the bottom of the distribution. In Section 2.1, we argued that such factors may include perceived gender discrimination in the labour market. In particular, unemployed females located at the lower end of the reservation wage distribution may share certain characteristics which make them more likely to suffer from wage discrimination exerted by employers toward females (de la Rica, 2008; Mussida and Picchio, 2014)[29]. This may translate into lower reservation wages for these women as they believe that they cannot get higher wages. In addition, unemployed females located at the bottom of the reservation wage distribution may have stronger preferences for time-flexible jobs, having to compensate for the lack of public policies which could allow them to reconcile work and family responsibilities. Hence, these women may target time-flexible jobs which in Italy are relatively rare and associated with low wages (Del Boca 2002; Mussida and Picchio, 2014)[30]. This is supported by the results from the quantile regression analysis showing that unemployed females located at the bottom of the reservation wage distribution have different preferences relating to job security and commuting distance, compared to those at the top of the distribution, suggesting that they aspire to different types of job.

2.7 Conclusion

In this chapter, we have investigated the determinants of the reservation wages of unemployed women and the determinants of the reservation wage gap between unemployed men and unemployed women in Italy, using the Italian LFS. To examine the determinants of reservation wages, previous studies have used OLS and the Oaxaca

[29] We analysed the summary statistics for women at the lowest quartile of the reservation wage distribution and compared them with the mean values. We found that women at the lowest quartile were more likely to be low educated, with more dependent children and other adults in the house, living in the South (the least industrialised area of the country), and were also more likely to have no previous working experience. de la Rica (2008) and Mussida and Picchio (2014) show that these characteristics are usually associated with (unobserved) wage discrimination.

[30] Our explanation is consistent with the findings of Caliendo et al (2017), who showed that women may anticipate discrimination in the labour market and lower their reservation wage accordingly.

decomposition of means. We have compared these methods with quantile regression as well as the decomposition of reservation wages across its entire distribution, to help shed light on individual-specific factors such as job aspirations as well as gender discrimination and occupational segregation of women into low paid jobs. We have argued that, due to the lack of family-friendly policies in Italy, unemployed females located at the bottom of the reservation wage distribution may have stronger preferences for nonwage attributes such as time flexibility. This can result in low reservation wages because these women may target jobs which are rarely found with high wages.

Our OLS findings show that the main differences in the determinants of reservation wages between unemployed females and unemployed males were related to household composition. For example, either having a partner or additional dependent children were found to be unrelated to the reservation wages of unemployed females but positively associated with the reservation wages of unemployed males. Men may be more affected because they are generally regarded as the main bread winners in Italian households. The number of other relatives of working age was found to be negatively associated with the reservation wages of unemployed females but unrelated to the reservation wages of unemployed males. In fact, informal help that these individuals potentially provide with household chores and care for other relatives, which in Italian households is usually provided by women (as will be discussed in detail in Chapter 3), may reduce the cost of such activities.

Gender differences were also found relating to previous labour market experience. For example, being unemployed for more than a year was negatively correlated with the reservation wages of males but uncorrelated with the reservation wages of females. This may reflect different attitudes of unemployed females such as being less impatient to enter the labour market compared to unemployed males. For women, the opportunity cost of being employed may be higher, having house responsibilities as an extra alternative

activity to the labour market. Hence, attitudes towards gender roles may also help to explain the different unemployment rates between males and females in Italy.

The results from the quantile regression analysis show that the effect of the explanatory variables is not constant across the distribution of reservation wages, reflecting unobservable individual characteristics such as different occupational aspirations. For example, we have found that the presence of cohabiting adults in the household was negatively related to the reservation wages of females at the 25th and 50th percentiles of the reservation wage distribution, but unrelated at the top of the distribution - while the opposite pattern was found for men. This is compatible with the hypothesis that unemployed females at the lower end of the reservation wage distribution may aspire to occupations that allow them to care for other individuals in the household. Hence, our results endorse the quantile regression approach for the analysis of reservation wages, as adopting the standard approach would not capture such heterogeneity in the results.

The Oaxaca decomposition showed that 84.5% of the reservation wage gap between unemployed males and unemployed females was unexplained, i.e. due to different returns from characteristics. 21% of the gap was explained by age, household composition and job preferences with respect to the type of contract sought and commuting distance. We have emphasized the importance of job preferences, which have been ignored by previous studies. Our findings have suggested that differences in reservation wages partly reflect individual preferences over commuting time and permanent employment. Future research may want to focus on designing survey questions to elicit more detailed information on the preferences of unemployed individuals with respect to other non-wage attributes such as the possibility of working with flexible hours.

Brown et al. (2011) investigated the gender reservation wage gap in the UK, using a decomposition method focusing on the group means. In addition, we have decomposed the reservation wage gap in Italy across the entire distribution of reservation wages, using

the estimator proposed by Melly (2005). The results show that the effect of different characteristics between males and females was found to be constant across the reservation wage distribution, and this supports the previous conclusions drawn using the Oaxaca decomposition. The effect of different coefficients between males and females was also constant across the reservation wage distribution, indicating that the counterfactual distribution of reservation wages for unemployed females would be shifted to the right if they had the same coefficients as unemployed males. Finally, the gender reservation wage gap was not constant, but relatively large at the lower part of the distribution, and this was mainly due to the effect of residual factors. We have argued that unobserved factors may be linked to different occupational expectations and perceived wage discrimination in the labour market. Having to combine career and household responsibilities, Italian females located at the bottom of the reservation wage distribution may have stronger preferences for time-flexible jobs, compared to their male counterparts. This may lead to lower reservation wages, since these women expect to be employed in low paid occupations and to be more likely to suffer from wage discrimination. Hence, policies aimed at increasing the employment rates of females should pay attention to such expectations.

This chapter has contributed to the existing literature in three ways. First, it has examined the relationship between the reservation wages of unemployed females and household structure, exploring in particular the role of co-resident adults. Previous studies have investigated the effect of co-resident adults on the labour force participation of Italian women (e.g. Pagani and Marenzi, 2008). Our findings have contributed to this analysis by showing a negative relationship between the reservation wages of unemployed females and the presence of other relatives in the household. This indicates that the increase in labour force participation may happen indirectly via an indirect moderating effect on the reservation wage. Second, we have found that job preferences play an important role in explaining the gender reservation wage gap in Italy. The existing

study by Brown et al. (2011) focusing on the UK did not consider the possibility that gender differences may arise as a consequence of different job preferences between males and females. Three, we have shown that unobservable factors related to occupational segregation and perceived discrimination may play an important role in explaining differences in employment rates between males and females. To show this, we have used the decomposition method by Melly (2005) which has rarely been used in the literature on reservation wages.

Some policy implications can be drawn from these results. First, preferences for non-wage attributes such as short commuting time and flexibility may partly explain the different employment rates between men and women. Hence, policy-makers and employers should make it possible for employed workers to opt for more flexible hours, which may help women reconcile family and work. We have also shown that women located at the lower part of the reservation wage distribution share certain characteristics (such as having, on average, low education, more dependent children and relatives, being more likely to live in deprived regions and having no previous working experience), which may make them more likely to perceive discrimination in the labour market. Public policies aimed at increasing the employment rates of females such as such as investing in subsidised childcare and care for the elderly should pay particular attention to these women.

From a methodological point of view, a weakness of the empirical analysis presented in this chapter can be attributed to the use of cross-sectional data rather than panel data. In fact, the availability of panel data would help to control for unobserved factors affecting reservation wages. However, this type of data is currently not available for the case of Italy. On the other hand, panel data may also suffer from attrition bias especially for the case of the reservation wages due to individuals leaving unemployment during the lifespan of the panel.

2.8 Tables

Table 2. 1 - Sample exclusions and missing values

	Observations	Percentage of unemployed surveyed
Total number of observations	58,288	100%
Exclusions		
If the individual is older than 64	75	0.12%
If the individual was looking for a part-time job, or had no preference about the working time	32,628	55.9%
If the individual had no preference between employed and self-employed job	13,878	23.8%
If the individual reported a reservation wage equal to zero	139	0.23%
Other outliers[31]	6	0.01%
If the individual was not actively looking for a job	401	0.68%
Total number of observations lost	35,841	61.49%
Total number of usable observations	22,447	38.51%

	Observations	Percentage of unemployed surveyed
Total number of unemployed looking for a full-time job	22,447	100%
Missing values		
Reservation wage question	5,312	23.66%
Job search duration question	661	2.94%
Unemployed benefit question	116	0.51%
Total number of missing values	5,946	26.49%
Total number of usable observations	16,501	73.51%

[31] 6 observations with reservation wages between €1 and €11 due to potential coding errors (see Section 2.3).

Table 2. 2 - Measures of the shapes of the reservation wage distributions by year

Period of analysis	2009 - 2011		2009		2010		2011	
Sample	Males	Females	Males	Females	Males	Females	Males	Females
Mean	6.927	6.798	6.936	6.812	6.935	6.810	6.907	6.771
Standard Deviation	0.261	0.269	0.258	0.272	0.259	0.254	0.265	0.277
Variance	0.068	0.072	0.066	0.074	0.067	0.065	0.070	0.077
Skewness	-0.995	-1.075	-1.167	-1.316	-0.996	-0.974	-0.819	-0.908
Kurtosis	15.361	9.515	16.963	11.005	15.607	7.960	13.764	9.294
Observations	10,113	6,388	3,492	2,159	3,446	2,156	3,175	2,073

Table 2. 3 - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
Outcome variables		
Reservation wage (log)	lrw	Continuous variable. Reservation wage, in Euros
Explanatory Variables		
Male	male	Binary variable (0, 1). 1 if individual is male; 0 otherwise.
Female	female	Binary variable (0, 1). 1 if individual is female; 0 otherwise.
Age	age	Continuous variable in years.
North-West	northwest	Binary variable (0, 1). 1 if individual is resident in the North-West (Piemonte, Liguria, Lombardia, Val D'Aosta); 0 otherwise.
North-East	northeast	Binary variable (0, 1). 1 if individual is resident in the North-East (Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna); 0 otherwise.
Centre	centre	Binary variable (0, 1). 1 if individual is resident in one of the six central Regions (Toscana, Umbria, Marche, Lazio, Abruzzo, Molise); 0 otherwise.
South	south	Binary variable (0, 1). 1 if the individual is resident in one of the four Southern regions (Campania, Basilicata, Puglia, Calabria); 0 otherwise.
Islands	islands	Binary variable (0, 1). 1 if individual is resident in either Sicilia or Sardegna; 0 otherwise.
Italian	italian	Binary variable (0, 1). 1 if nationality is Italian; 0 if the nationality is different from Italian.
Foreign (EU)	foreign_eu	Binary variable (0, 1). 1 if nationality is not Italian but from another EU country; 0 otherwise.
Foreign (non-EU)	foreign_extraeu	Binary variable (0, 1). 1 if nationality is from a non-EU country; 0 otherwise.
Low Level of Education Attained	loweducation	Binary variable (0, 1). 1 if the highest level of education attained by the individual is primary school; 0 otherwise.
Middle Level of Education Attained	high_school	Binary variable (0, 1). 1 if the highest level of education attained by the individual is a high school diploma; 0 otherwise.
High Education Attained	higheducation	Binary variable (0, 1). 1 if the individual has attained a university degree level; 0 otherwise.
Dependent children	own_children_under16_n	Continuous variable. Number of children younger than 16 living in the household.
Other adults	other_adults	Continuous variable. Number of relatives older than 16 living in the household.
No partner	nopartner	Binary variable (0, 1). 1 if the reference person has no partner; 0 otherwise.
Non-employed partner	nonemployed_part	Binary variable (0, 1). 1 if the partner of the reference person is unemployed or inactive; 0 otherwise.
Employed partner	employed_part	Binary variable (0, 1). 1 if the partner of the reference person is employed; 0 otherwise.
Looking for a permanent job	onlypermanent	Binary variable (0, 1). 1 if the individual is only looking for a permanent job; 0 otherwise.
No Commuting	nocommuting	Binary variable (0, 1). 1 if the individual is looking for a job in the same municipality where he/she lives; 0 otherwise.
Close Commuting	closecommuting	Binary variable (0, 1). 1 if the individual is looking for a job in the municipality that is reachable every day; 0 otherwise.
Any Commuting in Italy	anycommuting_italy	Binary variable (0, 1). 1 if the individual is looking for a job anywhere in Italy; 0 otherwise.
Any Commuting in Europe	anycommuting_europe	Binary variable (0, 1). 1 if the individual is looking for a job anywhere in Europe; 0 otherwise.

Table 2. 3 (continued) - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
Job search (activity 1)	jobsearch1	Binary variable (0, 1). 1 if the individual applied to participate in a public competition, during the reference period; 0 otherwise.
Job search (activity 2)	jobsearch2	Binary variable (0, 1). 1 if the individual examined vacancies in the newspapers, during the reference period; 0 otherwise.
Job search (activity 3)	jobsearch3	Binary variable (0, 1). 1 if the individual put ads in the newspapers or responded to job advertisements, during the reference period; 0 otherwise.
Job search (activity 4)	jobsearch4	Binary variable (0, 1). 1 if the individual sent CV to a private company, during the reference period; 0 otherwise.
Job search (activity 5)	jobsearch5	Binary variable (0, 1). 1 if the individual contacted relatives, friends, acquaintances, trade unions to find work, during the reference period; 0 otherwise.
Job search (activity 6)	jobsearch6	Binary variable (0, 1). 1 if the individual was recommended to potential employers by friends or relatives, during the reference period; 0 otherwise.
Job search (activity 7)	jobsearch7	Binary variable (0, 1). 1 if the individual looked for a job on the internet, during the reference period; 0 otherwise.
Job search (activity 8)	jobsearch8	Binary variable (0, 1). 1 if the individual looked for a job contacting employment agencies or other intermediary structures, during the reference period; 0 otherwise.
Job search (activity 9)	jobsearch9	Binary variable (0, 1). 1 if the individual looked for a job undertaking other job search activities, during the reference period; 0 otherwise.
Job search index	jobsearchindex	Categorical variable (0 to 9). The number indicates the number of the above job search activities undertaken by the individual.
Never worked	neverworked	Binary variable (0, 1). 1 if the individual has never worked prior the interview date; 0 otherwise.
Re-entering the labour market	Reenter	Binary variable (0, 1). 1 if the individual re-enter the labour market after a period of inactivity; 0 otherwise.
Long term employment	longterm_unempl	Binary variable (0, 1). 1 if the individual was unemployed for more than 12 months; 0 otherwise.
Unemployment benefits	unemplbenefit	Binary variable (0, 1). 1 if the individual was receiving unemployment benefits at the interview date; 0 otherwise.
year (2009)	y2009	Binary variable (0, 1). 1 if the individual was interviewed in 2009; 0 otherwise.
year (2010)	y2010	Binary variable (0, 1). 1 if the individual was interviewed in 2010; 0 otherwise.
year (2011)	y2011	Binary variable (0, 1). 1 if the individual was interviewed in 2011; 0 otherwise.

Table 2. 4 - Summary statistics for each estimation sample; explanatory variables

	Sample of all individuals (1)				Sample of males (2)				Sample of females (3)				t-test
	Mean	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**(*)[A]**
age	34.48	11.42	16	64	35.27	11.81	16	64	33.23	10.67	16	64	*
own children	0.33	0.70	0	8	0.36	0.74	0	8	0.30	0.63	0	5	*
other adults	1.50	1.32	0	9	1.50	1.31	0	9	1.51	1.34	0	7	
job search index	3.41	1.69	0	9	3.39	1.69	0	9	3.45	1.69	0	9	
job search duration	20.59	29.81	0	180	19.66	28.23	0	180	22.06	32.08	0	180	*
		%				**%**				**%**			
male		61.3				-				-			-
female		38.7				-				-			-
Citizenship													
Italian		82.6				83.10				81.87			
foreign (EU)		4.6				3.47				6.50			*
foreign (outside EU)		12.7				13.43				11.63			*
Education													
low education		48.9				54.97				39.24			*
high school		40.5				38.30				44.09			*
high education		10.2				6.56				16.07			*
Region													
north-west		25.4				24.55				26.72			*
north-east		15.5				15.04				16.23			*
centre		14.2				13.43				15.30			*
islands		16.6				17.60				15.12			*
south		28.3				29.37				26.63			*

Table 2. 4 (continued) - Summary statistics for each estimation sample; explanatory variables

	Sample of all individuals (1)	Sample of males (2)	Sample of females (3)	t-test
	%	%	%	(*)
Partner employment status				
no partner	53.6	52.3	55.7	*
non-employed partner	17.5	23.1	8.6	*
employed partner	20.6	16.9	26.3	*
Job preferences				
only permanent	4.7	5.32	3.83	*
no commuting	12.6	9.22	17.92	*
close commuting	67.1	66.78	67.72	
any communting (Italy)	13.6	16.10	9.69	*
any communting (Europe)	6.6	7.83	4.63	*
Other				
never worked	24.3	19.88	31.32	*
long-term unemployment	40.3	40.06	40.68	
re-enter	42.7	36.06	53.33	*
unemployment benefits	10.5	12.42	7.53	*
Wave				
2009	34.5	34.76	34.04	
2010	33.9	34.03	33.75	
2011	31.6	31.21	32.21	
Observations	**16,501**	**10,113**	**6,388**	

NOTES: The star indicates whether the differences in the mean variables between males (column 2) and females (column 3) are statistically different, at 5% significance level.

Table 2.5 - OLS regression; dependent variable: log reservation wage; sample = individuals looking for a full-time job

Column	(1)	(2)	(3)
Variables	all	females	males
Individual characteristics			
female	-0.114***	-	-
	(0.004)		
age	0.014***	0.016***	0.015***
	(0.001)	(0.002)	(0.002)
age squared (10^3)	-0.142***	-0.183***	-0.152***
	(0.000)	(0.000)	(0.000)
foreign_eu[1]	-0.057***	-0.053***	-0.056***
	(0.008)	(0.011)	(0.011)
foreign_extraeu[1]	-0.068***	-0.030***	-0.085***
	(0.006)	(0.010)	(0.007)
high_school[2]	0.038***	0.043***	0.037***
	(0.004)	(0.007)	(0.006)
higheducation[2]	0.124***	0.146***	0.097***
	(0.008)	(0.010)	(0.012)
Region[3]			
northwest	0.057***	0.105***	0.036***
	(0.006)	(0.010)	(0.007)
northeast	0.074***	0.117***	0.054***
	(0.007)	(0.011)	(0.009)
centre	0.019**	0.048***	0.006
	(0.007)	(0.012)	(0.009)
islands	0.024***	0.036***	0.015**
	(0.007)	(0.011)	(0.008)
Household composition			
own_children_under16_n	0.014***	-0.003	0.017***
	(0.004)	(0.006)	(0.005)
other_adults_n	-0.003	-0.011***	0.001
	(0.002)	(0.003)	(0.002)
employed_part[4]	0.022***	-0.014	0.047***
	(0.006)	(0.009)	(0.009)
nonemployed_part[4]	0.052***	-0.006	0.064***
	(0.007)	(0.013)	(0.009)
Job preferences			
onlypermanent	0.098***	0.120***	0.086***
	(0.009)	(0.017)	(0.010)
closecommuting[5]	0.042***	0.040***	0.038***
	(0.007)	(0.009)	(0.010)
anycommunting_Italy[5]	0.144***	0.170***	0.128***
	(0.009)	(0.014)	(0.012)
anycommunting_Europe[5]	0.187***	0.132***	0.202***
	(0.012)	(0.022)	(0.015)

Table 2.5 (continued) - OLS regression; dependent variable: log reservation wage; sample = individuals looking for a full-time job

Column	(1)	(2)	(3)
Variables	all	females	males
Labour market			
neverworked	-0.004	0.012	-0.021**
	(0.007)	(0.010)	(0.010)
longterm_unempl	-0.033***	-0.007	-0.045***
	(0.004)	(0.007)	(0.005)
re-enter	-0.013**	-0.002	-0.013*
	(0.005)	(0.008)	(0.007)
jobsearchindex	0.008***	0.009***	0.006***
	(0.001)	(0.002)	(0.002)
Year[6]			
2010	-0.001	-0.004	0.001
	(0.005)	(0.008)	(0.006)
2011	-0.031***	-0.039***	-0.028***
	(0.005)	(0.008)	(0.006)
constant	6.500***	6.342***	6.498***
	(0.027)	(0.044)	(0.034)
Observations	16,501	6,388	10,113
R-squared	0.187	0.142	0.163

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Nationality: Italian; 2- Education: low education; 3- Region: South; 4 - Partner's employment status: no cohabiting partner; 5- Commuting preference: no commuting; 6- Year: 2009.

Table 2.6 - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
Individual characteristics									
female	-0.121***	-0.086***	-0.089***	-	-	-	-	-	-
	(0.005)	(0.004)	(0.004)						
age	0.018***	0.014***	0.010***	0.017***	0.014***	0.005***	0.022***	0.014***	0.012***
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
age squared (10^3)	-0.200***	-0.147***	-0.086***	-0.207***	-0.160***	-0.055***	-0.247***	-0.147***	-0.121***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
foreign_eu[1]	-0.052***	-0.051***	-0.064***	-0.054***	-0.053***	-0.029***	-0.043***	-0.044***	-0.058***
	(0.009)	(0.007)	(0.007)	(0.016)	(0.011)	(0.007)	(0.010)	(0.010)	(0.012)
foreign_extraeu[1]	-0.059***	-0.055***	-0.058***	-0.020	-0.027***	-0.018***	-0.062***	-0.057***	-0.066***
	(0.006)	(0.005)	(0.006)	(0.013)	(0.010)	(0.005)	(0.007)	(0.006)	(0.008)
high_school[2]	0.029***	0.029***	0.029***	0.034***	0.042***	0.016***	0.024***	0.020***	0.024***
	(0.004)	(0.004)	(0.004)	(0.010)	(0.007)	(0.004)	(0.005)	(0.005)	(0.005)
higheducation[2]	0.090***	0.088***	0.116***	0.124***	0.105***	0.151***	0.057***	0.064***	0.104***
	(0.008)	(0.007)	(0.009)	(0.012)	(0.010)	(0.011)	(0.009)	(0.011)	(0.010)
Region[3]									
northwest	0.075***	0.036***	0.006	0.139***	0.098***	0.019***	0.039***	0.008	-0.001
	(0.007)	(0.005)	(0.006)	(0.014)	(0.012)	(0.005)	(0.007)	(0.006)	(0.007)
northeast	0.083***	0.045***	0.022***	0.137***	0.103***	0.023***	0.044***	0.021***	0.018**
	(0.008)	(0.006)	(0.007)	(0.015)	(0.013)	(0.006)	(0.008)	(0.008)	(0.009)
centre	0.027***	-0.004	-0.018***	0.070***	0.033**	-0.002	0.001	-0.014**	-0.020**
	(0.008)	(0.006)	(0.007)	(0.015)	(0.013)	(0.006)	(0.008)	(0.007)	(0.008)
islands	0.017**	-0.008	-0.015**	0.053***	0.010	0.003	-0.003	-0.018***	-0.019***
	(0.008)	(0.006)	(0.006)	(0.015)	(0.016)	(0.006)	(0.007)	(0.007)	(0.007)

Table 2.6 (continued) - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
Household composition									
own_children_under16_n	0.013***	0.013***	0.017***	-0.001	0.005	-0.000	0.009**	0.014***	0.017***
	(0.003)	(0.003)	(0.004)	(0.009)	(0.006)	(0.002)	(0.004)	(0.005)	(0.005)
other_adults_n	-0.001	0.000	-0.003*	-0.012***	-0.007**	-0.002	0.006**	0.004**	-0.004*
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
employed_part[4]	0.011*	0.012***	0.018***	-0.015	-0.010	-0.006	0.029***	0.023***	0.041***
	(0.006)	(0.005)	(0.006)	(0.011)	(0.008)	(0.005)	(0.008)	(0.007)	(0.010)
nonemployed_part[4]	0.047***	0.029***	0.041***	0.001	-0.017	-0.005	0.055***	0.038***	0.053***
	(0.007)	(0.005)	(0.007)	(0.013)	(0.013)	(0.005)	(0.008)	(0.007)	(0.010)
Job preferences									
onlypermanent	0.082***	0.084***	0.091***	0.074***	0.099***	0.143***	0.058***	0.082***	0.068***
	(0.009)	(0.010)	(0.013)	(0.022)	(0.018)	(0.020)	(0.012)	(0.011)	(0.012)
Closecommuting[5]	0.037***	0.019***	0.015***	0.054***	0.037***	0.007*	0.018**	0.004	0.004
	(0.009)	(0.005)	(0.005)	(0.012)	(0.010)	(0.004)	(0.008)	(0.006)	(0.007)
anycommunting_Italy[5]	0.112***	0.108***	0.123***	0.169***	0.166***	0.145***	0.072***	0.085***	0.113***
	(0.011)	(0.008)	(0.008)	(0.021)	(0.015)	(0.019)	(0.010)	(0.010)	(0.010)
anycommunting_Europe[5]	0.111***	0.137***	0.206***	0.103***	0.120***	0.148***	0.100***	0.135***	0.217***
	(0.013)	(0.011)	(0.012)	(0.024)	(0.016)	(0.024)	(0.013)	(0.014)	(0.014)
Labour market									
neverworked	-0.019**	-0.006	0.006	0.002	0.008	0.004	-0.032***	-0.013*	-0.003
	(0.008)	(0.006)	(0.006)	(0.012)	(0.011)	(0.005)	(0.009)	(0.008)	(0.007)
longterm_unempl	-0.027***	-0.024***	-0.031***	0.001	-0.010	-0.002	-0.032***	-0.032***	-0.038***
	(0.004)	(0.003)	(0.004)	(0.009)	(0.006)	(0.003)	(0.005)	(0.004)	(0.005)
re-enter	-0.008	-0.001	-0.010*	-0.004	0.005	0.003	-0.003	-0.004	-0.010
	(0.006)	(0.004)	(0.005)	(0.010)	(0.008)	(0.004)	(0.006)	(0.005)	(0.006)

Table 2.6 (continued) - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
jobsearchindex	0.007***	0.008***	0.005***	0.009***	0.009***	0.004***	0.005***	0.008***	0.003**
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Year[6]									
2010	-0.007	-0.000	0.005	-0.007	-0.011	-0.008**	-0.004	0.005	0.006
	(0.005)	(0.004)	(0.004)	(0.009)	(0.007)	(0.004)	(0.005)	(0.005)	(0.006)
2011	-0.040***	-0.028***	-0.020***	-0.050***	-0.042***	-0.029***	-0.036***	-0.024***	-0.015***
	(0.005)	(0.004)	(0.005)	(0.011)	(0.008)	(0.004)	(0.005)	(0.005)	(0.006)
constant	6.358***	6.557***	6.761***	6.217***	6.422***	6.772***	6.315***	6.581***	6.731***
	(0.030)	(0.022)	(0.023)	(0.066)	(0.044)	(0.029)	(0.034)	(0.027)	(0.030)
Observations	16,501	16,501	16,501	6,388	6,388	6,388	10,113	10,113	10,113
R-squared	0.177	0.182	0.173	0.133	0.138	0.102	0.148	0.154	0.150

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Nationality: Italian; 2- Education: low education; 3- Region: South; 4- Partner's employment status: no partner in the household; 5- Commuting preference: no commuting; 6- Year: 2009.

Table 2. 7 - Oaxaca decomposition; dependent variable: reservation wage; sample = individuals looking for a full-time job

Predicted reservation wage (log)	Overall	*(% of the total gap)*	Explained	*(% of the total gap)*	Unexplained	*(% of the total gap)*
females	6.798***	-	-	-	-	-
	(0.003)					
males	6.927***	-	-	-	-	-
	(0.003)					
Decomposition component	0.129***	*100%*	0.020***	*15.5%*	0.109***	*84.5%*
	(0.004)		(0.003)		(0.005)	
Variables						
Age	-		0.006***	*4.6%*	0.002	*1.6%*
			(0.001)		(0.050)	
Region	-		-0.001***	*-0.8%*	-0.038***	*-29.5%*
			(0.000)		(0.008)	
nationality	-		0.000	*0%*	-0.007***	*-5.4%*
			(0.001)		(0.002)	
education	-		-0.012***	*-9.3%*	-0.010*	*-7.7%*
			(0.001)		(0.005)	
household	-		0.006***	*4.6%*	0.046***	*35.7%*
			(0.001)		(0.008)	
job preferences	-		0.015***	*11.6%*	-0.003	*-2.3%*
			(0.001)		(0.011)	
labour market	-		0.005***	*3.9%*	-0.042***	*-32.6%*
			(0.001)		(0.011)	
Year	-		0.000	*0%*	0.005	*3.9%*
			(0.000)		(0.006)	
Constant	-		-	-	0.157***	*121.7%*
					(0.055)	
Observations	16,501		16,501		16,501	

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Explanatory variables were grouped as follows: 1- Age: age, age squared; 2- Region: North-East, North-West, Centre, South; 3- Nationality: foreign (EU), foreign (extra-EU); 4- Education: high school; higher education; 5- Household: employed partner, unemployed partner, dependent children, other adults; 6- Job Preferences: only permanent, close commuting, commuting (Italy), commuting (Europe); 7- labour market factors: never worked, long-term unemployment, job search index, 8- Year: 2010; 2011.

Table 2. 8 - Melly (2005) decomposition of differences in distribution

Quantile	25th	50th	75th
Raw difference	0.138***	0.090***	0.121***
	(0.005)	(0.004)	(0.006)
Characteristics	0.013***	0.011***	0.017***
	(0.002)	(0.002)	(0.004)
	9.4%	*12.2%*	*14.1%*
Coefficients	0.095***	0.087***	0.086***
	(0.006)	(0.005)	(0.007)
	68.8%	*96.6%*	*71.1%*
Residuals	0.030***	-0.008***	0.018***
	(0.004)	(0.003)	(0.005)
	21.7%	*-8.8%*	*14.8%*

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
NOTES: standard errors were computed by bootstrapping the results 100 times.

Appendix A

A.1 Unemployment Benefits in Italy

In this appendix, we summarise the requirements for receiving unemployment benefits in Italy for the period under consideration (2009-2011). In particular, between 2008 and 2013, workers could apply for one of three types of unemployment benefits regulated by Italian law[32]. First, 'ordinary unemployment benefit' (in Italian, *indennità ordinaria di disoccupazione*) was granted to unemployed individuals who had worked for at least 52 weeks in the two years prior to job loss. These individuals were entitled to receive 60 percent of the salary during the first six months of unemployment, 50 percent during the next two months, and 40 percent for the remaining period up to one year. However, this period could be extended for up to two years for individuals over 50 years old, and a monthly cap was also established by law and adjusted for inflation annually. Second, the 'extra-ordinary unemployment benefit' (*indennità straordinaria di disoccupazione*) was a reduced form of the ordinary unemployment benefits, being granted for 6 months to those individuals who had worked for at least 78 days in the year prior to job loss. In this case, the sum received was equal to 40 percent of the last wage, during the first four months of unemployment, and 35 percent of the last wage for the fifth and sixth months of unemployment.

A third type of unemployment benefit was the so-called 'mobility allowance' (in Italian, *indennità di mobilità*) and applicable to those individuals who were employed on a permanent basis in a company with more than 15 employees before losing their job. In this case, the financial support was equal to the entire wage for the first 12 months, and 80% of the wage for the remaining period. The duration of the benefit varied from 1 to 3 years, depending on the age of lay-off. However, this type of compensation was subject

[32] The rules for unemployment benefits were modified in 2013, with the introduction of a simpler job benefit scheme called ASPI (see law n.92 of 28 June 2012).

to suspension in one of the following cases: if the person refused a training program offered by the regional public centres, if they refused a job offer with a salary that was no lower than 80% of the previous salary, or if they reached the statutory retirement age of 65.

Appendix B: Robustness Check Analysis with Controls for Receiving Unemployment Benefits

Table B. 1 - OLS regression; dependent variable: log reservation wage; sample =individuals looking for a full-time job

Column	(1)	(2)	(3)
Variables	all	females	males
Individual characteristics			
female	-0.115***	-	-
	(0.004)		
age	0.014***	0.015***	0.016***
	(0.001)	(0.002)	(0.002)
age squared (10^3)	-0.142***	-0.171***	-0.164***
	(0.000)	(0.000)	(0.000)
foreign_eu[1]	-0.053***	-0.053***	-0.049***
	(0.008)	(0.011)	(0.011)
foreign_extraeu[1]	-0.066***	-0.030***	-0.081***
	(0.006)	(0.010)	(0.007)
high_school[2]	0.038***	0.043***	0.037***
	(0.004)	(0.007)	(0.006)
higheducation[2]	0.127***	0.149***	0.096***
	(0.008)	(0.010)	(0.012)
Region[3]			
northwest	0.062***	0.104***	0.043***
	(0.006)	(0.010)	(0.007)
northeast	0.080***	0.114***	0.063***
	(0.007)	(0.010)	(0.009)
centre	0.023***	0.047***	0.012
	(0.007)	(0.011)	(0.009)
islands	0.024***	0.036***	0.016**
	(0.007)	(0.011)	(0.008)
Household composition			
own_children_under16_n	0.014***	-0.003	0.017***
	(0.004)	(0.006)	(0.005)
other_adults_n	-0.003	-0.010***	0.001
	(0.002)	(0.003)	(0.002)
employed_part[4]	0.023***	-0.013	0.051***
	(0.006)	(0.009)	(0.009)
nonemployed_part[4]	0.052***	-0.003	0.068***
	(0.007)	(0.013)	(0.009)
Job preferences			
onlypermanent	0.101***	0.123***	0.089***
	(0.009)	(0.017)	(0.010)
closecommuting[5]	0.042***	0.038***	0.040***
	(0.007)	(0.009)	(0.011)
anycommunting_Italy[5]	0.146***	0.170***	0.131***
	(0.009)	(0.014)	(0.012)
anycommunting_Europe[5]	0.191***	0.129***	0.210***
	(0.012)	(0.022)	(0.015)

Table B.1 (continued)- OLS regression; dependent variable: log reservation wage; sample =individuals looking for a full-time job

Column	(1)	(2)	(3)
Variables	all	females	males
Labour market			
unempl_benefit	0.061***	0.059***	0.056***
	(0.006)	(0.011)	(0.007)
jobsearchindex	0.007***	0.008***	0.006***
	(0.001)	(0.002)	(0.002)
Year[6]			
2010	-0.003	-0.005	-0.002
	(0.005)	(0.008)	(0.006)
2011	-0.034***	-0.038***	-0.032***
	(0.005)	(0.008)	(0.006)
constant	6.482***	6.370***	6.448***
	(0.024)	(0.040)	(0.030)
Observations	16,501	6,388	10,113
R-squared	0.187	0.145	0.158

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Region: South; 2- Nationality: Italian; 3- Education: low education; 4- Partner's employment status: no cohabiting partner; 5- Commuting preference: no commuting; 6- Year: 2009.

Table B. 2 - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
Individual characteristics									
female	-0.119***	-0.086***	-0.090***	-	-	-	-	-	-
age	(0.005)	(0.004)	(0.004)	0.016***	0.013***	0.005***	0.023***	0.012***	0.012***
	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
age squared (10^3)	-0.185***	-0.137***	-0.087***	-0.206***	-0.151***	-0.057***	-0.251***	-0.134***	-0.116***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
foreign_eu[1]	-0.045***	-0.053***	-0.061***	-0.056***	-0.052***	-0.033***	-0.035***	-0.048***	-0.049***
	(0.008)	(0.007)	(0.007)	(0.015)	(0.012)	(0.007)	(0.009)	(0.009)	(0.013)
foreign_extraeu[1]	-0.053***	-0.052***	-0.058***	-0.029**	-0.025***	-0.018***	-0.057***	-0.053***	-0.058***
	(0.006)	(0.005)	(0.006)	(0.012)	(0.009)	(0.006)	(0.006)	(0.007)	(0.009)
high_school[2]	0.032***	0.027***	0.029***	0.029***	0.040***	0.017***	0.024***	0.020***	0.021***
	(0.005)	(0.004)	(0.004)	(0.009)	(0.007)	(0.004)	(0.005)	(0.005)	(0.005)
higheducation[2]	0.093***	0.090***	0.118***	0.122***	0.106***	0.149***	0.060***	0.066***	0.111***
	(0.007)	(0.006)	(0.009)	(0.011)	(0.009)	(0.012)	(0.009)	(0.012)	(0.011)
Region[3]									
northwest	0.078***	0.036***	0.010*	0.141***	0.096***	0.018***	0.039***	0.013**	0.001
	(0.007)	(0.005)	(0.006)	(0.014)	(0.012)	(0.005)	(0.007)	(0.006)	(0.007)
northeast	0.084***	0.049***	0.025***	0.141***	0.101***	0.023***	0.048***	0.031***	0.024**
	(0.008)	(0.006)	(0.007)	(0.014)	(0.013)	(0.007)	(0.008)	(0.008)	(0.009)
centre	0.029***	-0.003	-0.014**	0.078***	0.034***	-0.004	0.000	-0.007	-0.015*
	(0.008)	(0.006)	(0.007)	(0.014)	(0.013)	(0.007)	(0.008)	(0.007)	(0.009)
islands	0.015*	-0.008	-0.015**	0.056***	0.011	0.003	-0.000	-0.015**	-0.019***
	(0.008)	(0.006)	(0.006)	(0.015)	(0.016)	(0.006)	(0.007)	(0.006)	(0.006)

Table B.2 (continued) - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
Household composition									
own_children_under16_n	0.013***	0.011***	0.016***	-0.002	0.007	-0.001	0.013***	0.013**	0.017***
	(0.003)	(0.003)	(0.004)	(0.008)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)
other_adults_n	-0.002	-0.000	-0.003*	-0.012***	-0.007**	-0.002	0.004*	0.004**	-0.003
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
employed_part[4]	0.013**	0.013***	0.020***	-0.013	-0.013	-0.004	0.030***	0.029***	0.050***
	(0.007)	(0.005)	(0.006)	(0.010)	(0.008)	(0.005)	(0.008)	(0.007)	(0.011)
nonemployed_part[4]	0.049***	0.027***	0.045***	0.005	-0.012	-0.002	0.054***	0.035***	0.060***
	(0.006)	(0.005)	(0.008)	(0.012)	(0.012)	(0.006)	(0.008)	(0.007)	(0.011)
Job preferences									
onlypermanent	0.087***	0.087***	0.088***	0.084***	0.101***	0.146***	0.059***	0.088***	0.080***
	(0.010)	(0.009)	(0.009)	(0.026)	(0.017)	(0.017)	(0.010)	(0.013)	(0.013)
Closecommuting[5]	0.041***	0.017***	0.015***	0.055***	0.037***	0.006	0.017*	0.004	0.004
	(0.009)	(0.006)	(0.006)	(0.012)	(0.010)	(0.004)	(0.010)	(0.006)	(0.006)
anycommunting_Italy[5]	0.123***	0.105***	0.120***	0.169***	0.167***	0.142***	0.077***	0.077***	0.117***
	(0.011)	(0.008)	(0.008)	(0.020)	(0.014)	(0.018)	(0.012)	(0.010)	(0.010)
anycommunting_Europe[5]	0.120***	0.138***	0.209***	0.105***	0.119***	0.133***	0.105***	0.143***	0.218***
	(0.013)	(0.012)	(0.013)	(0.023)	(0.017)	(0.020)	(0.014)	(0.013)	(0.013)
Labour market									
unempl_benefits	0.049***	0.044***	0.044***	0.062***	0.029***	0.052***	0.035***	0.057***	0.040***
	(0.005)	(0.006)	(0.007)	(0.013)	(0.009)	(0.018)	(0.006)	(0.009)	(0.009)
jobsearchindex	0.008***	0.007***	0.006***	0.008***	0.009***	0.004***	0.005***	0.007***	0.003*
	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)

Table B.2 (continued) - Quantile regression; dependent variable: reservation wage; samples = females and males looking for a full-time job.

Sample	all			females			males		
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Quantiles	0.25	0.5	0.75	0.25	0.5	0.75	0.25	0.5	0.75
Year[6]									
2010	-0.008	0.000	0.002	-0.008	-0.006	-0.009**	-0.004	0.002	0.004
	(0.005)	(0.004)	(0.005)	(0.009)	(0.007)	(0.004)	(0.005)	(0.005)	(0.006)
2011	-0.045***	-0.030***	-0.021***	-0.048***	-0.040***	-0.029***	-0.040***	-0.027***	-0.018***
	(0.005)	(0.004)	(0.005)	(0.010)	(0.008)	(0.004)	(0.006)	(0.005)	(0.006)
constant	6.346***	6.566***	6.755***	6.228***	6.434***	6.775***	6.281***	6.589***	6.718***
	(0.030)	(0.020)	(0.023)	(0.054)	(0.041)	(0.027)	(0.032)	(0.028)	(0.026)
Observations	16,501	16,501	16,501	6,388	6,388	6,388	10,113	10,113	10,113
R-squared	0.179	0.183	0.174	0.136	0.140	0.109	0.144	0.149	0.145

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Nationality: Italian; 2- Education: low education; 3- Region: South; 4- Partner's employment status: no partner in the household; 5- Commuting preference: no commuting; 6- Year: 2009.

Table B. 3 - Oaxaca decomposition; dependent variable: reservation wage; sample = individuals looking for a full-time job

Predicted reservation wage (log)	(1) overall	*(% of the total gap)*	(2) explained	*(% of the total gap)*	(3) unexplained	*(% of the total gap)*
females	6.798***	-	-	-	-	-
	(0.003)					
males	6.927***	-	-	-	-	-
	(0.003)					
Decomposition component	0.129***	*100%*	0.017***	*13.2%*	0.112***	*86.8%*
	(0.004)		(0.002)		(0.004)	
Variables						
age	-	-	0.005***	*3.9%*	0.045	*3.5%*
			(0.001)		(0.046)	
region	-	-	-0.001***	*-0.8%*	-0.033***	*-25.6%*
			(0.000)		(0.008)	
nationality	-	-	0.000	*0%*	-0.006***	*-4.6%*
			(0.001)		(0.002)	
education	-	-	-0.012***	*-9.3%*	-0.011**	*-8.5%*
			(0.001)		(0.005)	
household	-	-	0.006***	*4.6%*	0.044***	*34.1%*
			(0.001)		(0.008)	
job preferences	-	-	0.016***	*12.4%*	0.000	*0%*
			(0.001)		(0.011)	
labour market	-	-	0.002***	*1.6%*	-0.009	*-7%*
			(0.000)		(0.009)	
year	-	-	0.000	*0%*	0.003	*2.3%*
			(0.000)		(0.006)	
Constant	-	-	-	-	0.078	*60.5%*
					(0.049)	
Observations	16,501		16,501		16,501	

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

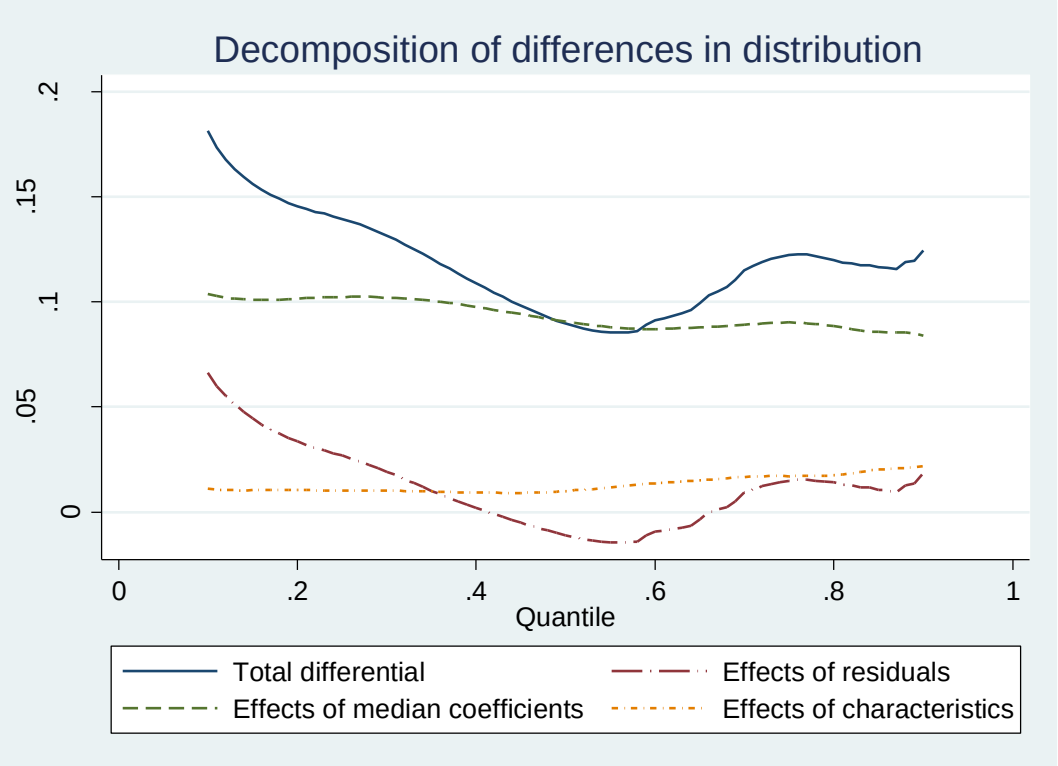
NOTES: Explanatory variables were grouped as follows: 1- Age: age, age squared; 2- Region: North-East, North-West, Centre, South; 3- Nationality: foreign (EU), foreign (extra-EU); 4- Education: high school; higher education; 5- Household: employed partner, unemployed partner, dependent children, other adults; 6- Job Preferences: only permanent, close commuting, commuting (Italy), commuting (Europe); 7- labour market factors: unemployment benefit, job search index, 8- Year: 2010; 2011.

Table B. 4 - Melly (2005) decomposition of differences in distribution

Quantile	25th	50th	75th
Raw difference	0.140***	0.087***	0.128***
	(0.005)	(0.005)	(0.006)
Characteristics	0.012***	0.011***	0.020***
	(0.002)	(0.002)	(0.004)
	8.5%	*13.2%*	*16.3%*
Coefficients	0.100***	0.088***	0.088***
	(0.006)	(0.004)	(0.007)
	71.1%	*100.9%*	*68.4%*
Residuals	0.029***	-0.012***	0.021***
	(0.004)	(0.003)	(0.006)
	20.5%	*-14.1%*	*15.3%*

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
NOTES: standard errors were computed by bootstrapping the results 100 times.

Figure B.1 - Decomposition of reservation wages using the Melly (2005) estimator. Robustness check with control for unemployment benefits



CHAPTER 3: LABOUR FORCE PARTICIPATION AND OCCUPATIONAL ATTAINMENT OF ITALIAN MOTHERS

3.1 Introduction

Although the labour force participation (LFP) of women in OECD countries has increased dramatically over the last few decades, there is still a persistent gap in participation rates when comparing males and females. In 2015, the percentage of women participating in the labour market was only 63%, compared to 81% for men (OECD, 2015). In Italy, one of the OECD countries with the lowest percentage of employed women, this difference was even higher, with the LFP rates for women and men being 55% and 75%, respectively. Furthermore, in OECD countries, there is also a difference in the occupational distribution between men and women, with women being under-represented in supervisory and managerial positions (European Commission, 2007).

Such differences may reflect the possibility that, in these countries, women are the main providers of housework within the household, whereas men are the main 'bread winners' within the family. According to the Harmonized European Time Use Survey (HETUS), Italian women spend 320 minutes per day, on average, doing housework and childcare, against just 95 minutes for men. On the other hand, men spend 255 minutes per day, on average, in the labour market whereas women participate in the labour market, on average, for 112 minutes a day.

Given the generally recognized role of women as providers of domestic work, it is not surprising that a large body of literature exists which investigates the determinants of female LFP, focusing on estimating the effects of housework and availability of childcare. For example, Coen-Pirani et al. (2010) found that the introduction of different household appliances in the US between 1960 and 1970 had a positive impact on female LFP, by reducing the time that women spent doing housework. Regarding childcare, Stolzenberg and Waite (1984) found that a mother's probability of being employed in the

US was affected by the number of childcare workers per region. Similarly, Del Boca (2002) found a positive relationship between the regional availability of nursery schools in Italy and the probability of entering the labour market after childbirth.

These studies have usually focused on a variety of measures of housework and childcare, aggregated to a regional level. The first aim of this chapter is to estimate a probit model to investigate the relationship between domestic work and the LFP of mothers, based on, in contrast to existing studies, household level measures of housework help and childcare. In accordance with Becker's (1965) framework of individual's time allocation, we employ two new measures of help with domestic work that are available within the household. The first captures the partner's engagement with childcare and the second indicates the availability of other individuals in the household to help with housework. The chapter uses data drawn from the Italian Sample Survey on Births, which is ideal for this purpose as it contains detailed information on the sharing of childcare and household tasks for 42,231 households that have a two-year-old child.

Studies from a related strand of the literature have explored the determinants of women's occupational attainment (see for example Brown et al., 1980; Reilly, 1991; and Kidd, 1993), investigating the effects of individual characteristics such as education, household composition, and labour market experience. However, none of these studies have considered the effect of childcare on the occupational attainment of women with children. Nonetheless, the lack of available childcare may represent a constraint on a mother rising to a certain job position, especially during the early years of a child's life when the child requires continuous care. Hence, the second aim of this chapter is to investigate the relationship between the availability of different childcare options and the occupational attainment of Italian mothers, measured as the probability of being in one of the following employment categories: self-employed, blue-collar, white-collar and managers. This research area is particularly interesting in the case of Italy, where the

availability of childcare for children younger than three is extremely limited. In fact, while the majority of families with children over the age of three have access to the state funded education system, only a small portion of children aged between zero and three years are able to attend kindergarten. For example, in 2012, the attendance rate at government funded nurseries for these children was only 15% (Istat, 2014). In addition, since the number of nurseries is regulated at a municipal level, this rate varied from less than 5% in cities of the southern regions, which generally have less financial resources, to more than 25%, in cities of the North-East regions (Istat, 2014). Finally, the presence of private kindergartens in the country is also very limited and their costs are unaffordable for most families (Chiuri, 2000).

Since childcare is mainly subsidised for children over the age of three, the cost of childcare falls substantially after the third year of life. According to Istat (2014), the monthly fee of a crèche for a child between zero and two years is approximately twice the cost of a nursery school for a child aged three and over.

The occupational attainment model is estimated using a multinomial logit model for the different employment categories, based on a sample of 22,556 employed mothers. The Italian Sample Survey on Births contains information on different formal and informal childcare arrangements used by a family to look after the child during the mother's working hours. These variables represent our key explanatory variables of interest.

The final aim of this chapter is to investigate the link between childcare and four different job attributes, namely: the number of hours worked, part-time versus full-time employment, public-sector versus private-sector employment, and temporary versus permanent employment. These labour market outcomes serve to capture the quality of employment (see Section 3.2.7 for more details) for the employed mothers. Although an extensive literature exists which explores these labour market outcomes, previous studies

have only focused on the role of personal characteristics such as education, labour market experience and, in rare cases, the cost of childcare. However, these studies have not considered the possibility that the availability of different childcare arrangements may also affect these labour market outcomes. For example, inaccessibility to subsidized childcare options may induce mothers to work on a part-time basis, in order to balance work and childcare (Del Boca, 2002; and Chiuri, 2000).

Our findings suggest that a partner's engagement with childcare and the availability of relatives to help with housework are positively related to the mother's probability of being employed two years after the birth of the child. The four types of occupation are found to be associated with different childcare options. For example, mothers using formal childcare arrangements are less likely to work as blue-collar workers, compared to being white-collar workers. Self-employed mothers and mothers in management tend to rely on more flexible childcare options such as babysitters. Finally, women relying on formal childcare (childminders, public or private nursery schools) are found to spend more time in the labour market.

This chapter is structured as follows. Section 3.2 provides an overview of the existing literature exploring the determinants of female LFP, occupational attainment and the other outcomes of interest, namely the number of hours worked, part-time versus full-time employment, public-sector versus private-sector employment, and temporary versus permanent employment. Section 3.3 describes the data, the dependent variables and the samples used in the analysis. In addition, Section 3.3 discusses the methodology used and describes the summary statistics. Section 3.4 discusses the results obtained from the different models and Section 3.5 concludes.

3.2 Literature Review

3.2.1 Theoretical Framework

The pioneering models of Becker (1965) and Gronau (1977) provide a framework which allows the analysis of how couples allocate their time among different activities. Becker (1965) introduced the concept of household production for which individuals produce commodities by allocating their time between paid and unpaid work. In this model, unpaid work is defined as the time that individuals spend producing a good that can be perfectly substituted for another good purchased on the market. Furthermore, individuals within the household obtain gains from specializing in either labour market or home production, according to their comparative advantage such as different abilities.

These models have been extended in many other dimensions and they have been used to better understand which factors affect a woman's decision to enter the labour market. For example, Kooreman and Kapteyn (1987) expanded the above framework introducing a model in which non-market time is disaggregated into several categories, including childcare and housework, allowing separation of the effect of childcare choices from choices related to other non-market activities.

Chiappori (1992) and Apps and Rees (2003) introduce household production into a collective household model and separate leisure from other non-market activities. Chiappori (1988) presents a model in which changes in relative wages may alter the individuals' allocation between paid and unpaid work. In particular, he predicts that the ratio of female to male time spent in domestic activities depends on the relative productivity in the labour market, given by the ratio between the female and male wage.

In contrast to Becker (1965), where individuals choose simultaneously how to allocate their time between market and non-market activities, Beblo and Robledo (2008) propose an alternative model in which the spouses select their time allocation sequentially. In particular, they set up a game theoretical framework that allows the

'leader' to decide his/her time allocation first, so that the choice of the follower (spouse) is restricted by the leader's behaviour.

These theoretical models have facilitated the empirical investigation of the determinants of the LFP of mothers, providing a framework for the analysis of the impact of the availability of housework and childcare within the household.

3.2.2 Determinants of Female Labour Force Participation

A large part of the empirical literature has focused on estimating the effects of own and spousal wages on the time allocation of couples. However, there has been no consensus on whether increases in wages affect the time that a woman dedicates to the labour market.

Kalenkoski et al. (2009) used a UK Time Use Survey conducted in 2000–2001 to estimate simultaneously the time allocated by couples to market work and non-market work. Based on a Tobit model, their findings indicate that wives' time was not responsive to changes in their own wages, whereas a one percent increase in the husband's wage had a negative effect on the time spent by women in the labour market. Bloemen et al. (2010) estimated a similar model using the Italian Time Use Survey, but their findings contradicted the aforementioned study. They found a positive effect of the female's wage on their own time spent in the labour market but no significant effect of the husband's wage. However, due to a lack of information in the Italian data set they used predicted wages extrapolated from a Bank of Italy Survey from 2002 and this may be the reason behind the divergence with the findings of Kalenkoski et al. (2009).

A different approach has been undertaken by Blau and Kahn (2007), who looked at the effect of own wage and spousal wage on the labour supply of wives, as measured by annual hours of work. They focused on a cross-sectional survey that observed American couples in 1980, 1990, and 2000. Using different model specifications, they

found own wage elasticities which range between 0.35 and 0.88 and cross wage elasticities which range between -0.19 and 0.36.

Another group of studies looked at the relative wages of wives to their husbands' wages as a measure of comparative advantage. For instance, Hallberg and Klevmarken (2003), and Kimmel and Connelly (2009) looked at the effect of relative wages on the number of hours that Swedish and American women, respectively, spent in the labour market but they did not find any statistically significant effect. Similarly, Van den Brink and Groot (1997) found that the relative wage did not have a statistically significant impact on the labour force participation of Dutch women. However, the inconsistency between these results and those found using spousal wages between these results may be due to the inseparability of income and substitution effects associated with changes in both own and partner's wages (Bredtmann, 2014).

In summary, the existing literature has not found a significant effect of spousal wages on female labour supply. Two exceptions are Kalenkoski et al. (2009) and Blau and Kahn (2007) but their results, based on cross-sectional data, differ substantially from each other. One potential omission is that these studies did not consider sources of help with childcare and housework, such as relatives or friends. If such availability exists, the time allocation of women may be affected.

3.2.3 The Effect of the Availability of Childcare and Childcare Cost on Mothers' Labour Force Participation

The empirical literature investigating the effect of childcare on a mother's labour market outcomes has looked at two different measures of childcare: the price of purchased childcare and the availability of childcare arrangements. In addition, childcare can be provided either in a formal or an informal way. In the first case, the caregiver is via a formal setting such a nursery school, whose services are usually regulated by law. In the

second case, childcare is provided by, for example, a relative, a friend or through other arrangements such as non-registered childminders.

The economic models of household behaviour discussed above predict that comparative advantage, as reflected in wages and abilities, can affect the time allocation of individuals. However, other external factors such as the introduction of a public policy aimed at reducing the cost of childcare, may increase the opportunity cost of being unemployed and allow women with children to enter the labour market (Hallberg and Klevmarken, 2003). Hence, there is a broad empirical literature focusing on the estimation of the effect of the price of purchased childcare on the employment of mothers. For example, Lundin et al. (2008) analysed the effect of a Swedish reform that introduced a cap on childcare prices in 2002. They used the entire population of two-parent households observed the year before and the year after the reform. Using a difference-in-differences regression, they conclude that the reduction in childcare cost had no effect on the mother's labour supply. A similar study was conducted by Havnes and Mogstad (2011) who analysed the effect of a Norwegian reform aimed to increase the child care coverage rate in Norway. They used a difference-in-differences approach exploiting the temporal variation in child care coverage. The sample used covered the entire population of Norwegian households observed over the period from 1967 to 2006. Their estimates showed that there was very little effect of the reform on maternal employment. Furthermore, the subsidies were found to have a crowding-out effect on the use of other informal childcare arrangements.

In a comprehensive survey, Currie and Blau (2004) summarized the results from twenty studies looking at the effect of the price of purchased childcare on maternal labour force participation, based on different US and Canadian samples. All these studies measured the price of child care by estimating the predicted value from a child care expenditure equation using OLS on the subsample of mothers who paid for care. The

employment equation was usually estimated using probit or logit models. Currie and Blau (2004) showed that the estimated price elasticities differ substantially among these studies, ranging from 0.06 to -3.60 and they attribute this discrepancy to two problems. First, all these studies measured the price of childcare using the predicted value from a childcare expenditure equation, based on the subsample of employed mothers who had paid for child care. This was usually estimated by a two-stage Heckman (1979) approach, in order to account for sample selection. However, the variables used for identification, such as the average wages of child care workers or the number of children by age, were usually subject to endogeneity. Second, most of these studies do not account for the existence of unpaid child care options. As a result, these findings arguably reflect a biased effect of the real price of childcare on employment. In fact, the price elasticities are found to be very small in studies that properly account for informal and unpaid childcare arrangements (Blau and Hagy, 1998; Tekin, 2007).

Given that price elasticities appear to be very small and measures of childcare price are subject to endogeneity issues, another group of studies has focused on the availability of formal and informal childcare arrangements as a determinant of maternal employment. Duvander and Sundstrom (2002) argue that informal sources of childcare have liberated mothers from home responsibilities and encourage them to enter the labour market. Stolzenberg and Waite (1984) looked at two different ratios to measure the availability of childcare: the number of childcare workers (at a regional level) divided by the total number of employed females, and the number of childcare workers divided by the total number of women in the labour force. Using the Public Use Sample panel from US Census Bureau's 1970 data, they estimate the effect of formal childcare on a woman's probability of labour force participation by the use of a probit model. Their estimates led to the conclusion that women with young children were more likely to be employed in areas with higher availability of childcare services. Del Boca (2002) exploited the

regional variation in the availability of nursery schools in Italy, using a sample of 227 mothers from a three-year household panel (the Survey on Household Income and Wealth) of the Bank of Italy. She estimated the impact of childcare on the probability of working using a fixed effects logit model and a cross-sectional logit specification. In both cases, the availability of child care facilities had a positive effect on the probability of working.

Leibowitz et al. (1988) looked at the effect of formal and informal sources of care on a mother's labour supply. Using data from the US National Longitudinal Survey of Young Women, they estimate a logit model based on a sample of mothers living in the US between 1966 and 1978. Their findings show that mothers who lived in the same area where they had grown up were 24.8 percentage points more likely to be employed two years after the childbirth. This analysis is based on the idea that women who live in the area in which they grew up have better access to a network of extended family and friends for childcare. One possible critique is that their network of relatives and friends might also reduce the cost of looking for a job, thereby allowing them to find a job more easily than women who live far from the area in which they were raised. If this is the case, their estimate would be biased.

In conclusion, the price elasticities of childcare have been found to be very small. However, the conclusions obtained from studies based on Sweden, Norway, Canada cannot be easily extended to the Italian case. In fact, since the range of public and private nursery schools in Italy is very limited, a decrease in the price of a nursery school is not likely to affect the use of those services. In addition, studies looking at the effect of the availability of childcare have usually focused on aggregate measures of childcare, such as the number of childcare workers per employed female, or the number of nursery schools at a regional level. However, the use of such aggregate measures may mask the heterogeneity of childcare within the same region, because in the case of Italy price and

availability of nursery schools are regulated at a municipal level. In this chapter, we use the father's engagement with childcare as a measure of childcare availability, which is measured at household level and therefore more suited to the case of Italy.

3.2.4 The Effect of Housework on Mothers' Labour Force Participation

The time that a woman can dedicate to the labour market is also constrained by other domestic responsibilities, such as housework. However, due to data shortages there are very few studies focusing on the effect of housework on maternal labour supply. One exception is Coen-Pirani et al. (2010), who looked at the effect of household appliance ownership on the labour force participation of married women, using micro-data from the US Census of the Population. The data had information on appliance ownership such as washing machines, freezers and dryers during the period 1960 to 1970. To control for potential reverse causality, due to the fact that employed women were more likely to be able to afford electric appliances, they adopted an instrumental-variable approach. More specifically, they used the average ownership rate of single women for a certain appliance as an instrument for the ownership of that appliance for married women. They noticed that the appliance ownership rates increased significantly during the 1960s, whereas the labour force participation rate of single women remained constant. Their findings show that household appliances had a positive and statistically significant impact on the observed increase in labour force participation of married women. However, one possible critique of this study is that their identification strategy relies on the assumption that the relative prices of appliances are independent of the labour supply decisions of married women.

The aforementioned study is, however, the only attempt to measure the effect of household appliances on female labour participation using micro-level data. A different approach was taken by de V. Cavalcanti and Tavares (2008) who used country level panel data for the period 1975 to 1999 to assess the impact of changes in the relative price of

home appliances on female labour supply. Their hypothesis is that the introduction of new technologies made electrical appliances more affordable, thus liberating women from the home and allowing them to enter the labour market. Their results supported a causal effect of the price of home appliances on the labour force participation of women. For example, the introduction of household electrical appliances accounted for 10 to 15% of the increase in the female labour participation between 1975 and 1999 in the United Kingdom.

3.2.5 The Effect of Within Household Time Allocation

Due to the lack of wage and income information in many datasets such as national Time Use Surveys, another strand of the literature has focused on testing for complementarity or substitutability in couples' time allocation. Complementarity arises if parents receive utility from spending time together whereas substitutability arises if there are gains from specialization within the household (Bredtmann, 2014).

For example, Kimmel and Connelly (2009) looked at the determinants of parents' time choices using a sample of 2600 couples from the American Time Use Survey. In particular, they considered the spouse's weekly hours of employment and the spouse's time in unpaid activities. Using an instrumental-variable approach, that controls for potential endogeneity problems, they found some evidence of substitutability in the couples' time allocation. Specifically, a positive relationship was found between the mother's hours of employment and the father's caregiving time on weekdays. The father's hours of employment were positively associated with the mother's caregiving time on weekends. The latter relationship was also positive but statistically insignificant on weekdays. Finally, they also found evidence of complementarity in couples' time allocation, but only relative to their leisure time.

Although Kimmel and Connelly (2009) provide evidence of substitutability in a couple's time allocation, there has not been a previous attempt to estimate the effect of

the partner's involvement in specific home activities on maternal labour force participation, a gap which this chapter aims to contribute to.

3.2.6 The Relationship Between Childcare and Occupational Attainment of Mothers

Previous studies have investigated the effect that motherhood has on a woman's working career, focusing on wage penalties (Harkness and Walfogel, 2003; Pacelli et al., 2013). In contrast, less research has been conducted on the relationship between childcare and the occupational attainment of mothers, which is surprising given that flexibility with respect to working time arrangements often varies across occupations (Eichhorst et al. 2013).

Studies of occupational attainment have often adopted multinomial logit models to estimate the determinants of different categories of observed occupational attainment. For example, to analyse the role of sex discrimination, Brown et al. (1980) presented an empirical model of occupational attainment, based on a sample of 4245 observations from the US National Longitudinal Survey over the period 1966 to 1971. Using a multinomial logit model, they estimated the predicted probability of attaining each of the occupational categories (professional technical, managerial, clerical, operatives, services and labourers), as a function of a set of explanatory variables including household composition, education and other individual characteristics. Comparing the occupational distribution between men and women, they found that women were segregated into clerical jobs, and had less access to managerial roles. However, their model does not consider the role of self-employment, which is potentially important for two reasons. First, individuals may choose to be self-employed to obtain higher earnings. Second, self-employment is often used by women to reconcile work and family life (Connelly, 1992b; Dawson et al., 2009). Following this methodology, Reilly (1991) analysed the occupational attainment of 1322 young women, using an Irish survey from 1982. He found that the probability of being employed in one of the six categories of occupation

(unskilled, skilled, clerical, professional-managerial and other) was positively associated with education and labour market experience, after controlling for other demographic variables. However, since the dataset did not contain information on household structure or marital status, their estimates are likely to be subject to bias. In fact, household composition may play an important role in influencing a woman's probability of being employed in a certain occupation (see e.g. Brown et al. 1980). Finally, in a cross-sectional analysis, Kidd (1993) looked at the determinants of female occupational attainment in the Australian labour market. Based on a sample of 4231 women from the Australian Bureau of Statistics 1982 Family Survey, he estimated a multinomial logit model where the dependent variable represents different occupation categories (professional, administration, clerical, sales, transport and services). He found that the probability of being employed in a certain occupation (administration, clerical, sales, and services) was influenced by marital status, education and labour market experience. However, the choice of explanatory variables was not based on a theoretical framework but by means of a stepwise procedure, testing for the joint significance of each additional set of variables included in the model and, hence, is arguably somewhat *ad hoc* from a theoretical perspective.

To conclude, although raising a child has been recognized to have an impact on a mother's career, previous attempts to model the occupational attainment of women have largely ignored the role of motherhood although Brown et al. (1980) recognized the role of family size. In the following empirical analysis, the effects of two different measures of childcare on the mother's occupational attainment are explored: namely, the childcare arrangements used to look after the child during the mother's working time; and expenditure on childcare, taking into account both formal and informal childcare arrangements.

3.2.7 The Effect of Childcare on Hours of Work, Part-Time, Temporary and Private-Sector Employment

A further extension of the analysis presented in this chapter will investigate the relationship between childcare and the following labour market outcomes: the number of hours worked, part-time versus full-time employment, public versus private-sector employment, and temporary versus permanent employment.

The analysis of different job attributes is of interest because these are linked to measures of job quality. Specifically, working time flexibility and job security represent two of several dimensions of job quality (Holman, 2013). Flexibility, including the possibility of working non-standard shifts such as part-time shifts, may allow women to reconcile family and work. Job security is usually indicated as being employed on a permanent contract (Clark and Postel-Vinay, 2009). Finally, job quality is also linked to the contractual benefits associated with a certain job, which may differ between public and private-sector contracts (Rizzica, 2015).

Since part-time jobs may allow mothers to combine having a career with caregiving and home responsibilities, previous studies have analysed the link between childcare and part-time employment. Rammohan and Whelan (2007) present a model where the mother's desired hours of work are a function of the cost of childcare, along with other covariates. However, due to the rigidities of labour market contracts, mothers can only choose among three possible options – unemployment, part-time work and full-time work – that they assume to be ordered. Hence, they estimate the effects of childcare cost on employment status by means of an ordered probit model. Using data from the Australian Household Income and Labour Dynamics, they found that the effect of childcare cost on either part-time, or full-time employment was statistically insignificant. Powel (1998) used the same methodology to estimate the effect of child care costs on the employment status of married mothers in Canada. Using pooled cross-section data from

the Canadian National Child Care Survey, her estimates indicate a negative effect of child care cost on both part-time and full-time employment. These studies are subject to a potential issue: they do not distinguish between employed and self-employed workers. Part-time workers were defined as those mothers who worked for less than 35 hours per week, and full-time workers, as those working for more than 35 hours per week. However, a woman might be able to work more hours in self-employment due to its flexibility. This chapter will investigate the determinants of part-time employment, focusing on those mothers who are working as employees only in order to avoid such issues. Female self-employment is analysed in detail in Chapter 4.

As an alternative to part-time employment, some studies have focused on the analysis of the number of hours worked by mothers. From a theoretical point of view, structural models of female labour supply show that the number of hours that a mother spends in the labour market depends on the cost of childcare (see e.g. Ribar, 1992; Michalopoulos et al., 1992). Hence, the empirical studies in the existing literature have looked at the role of government subsidies, aimed at reducing the cost of childcare. For example, Gelbach (2002) estimated the effect of free public school enrolment on the number of hours worked per week by mothers of five-year-old children. He adopted an instrumental variable approach to address an endogeneity issue arising from the fact that in the US parents may decide to enrol their children in a private school or postpone their school enrolment for a year. In particular, the child's quarter of birth was used as an instrument for public school enrolment. Based on a sample of 52,134 women from the 1980 US Census, the findings show that public schooling was associated with an increase in the mother's labour supply by 2.7 hours. In a similar study, Averett et al. (1997) used a dual-error model to estimate the effect of childcare cost on the labour supply of married women, measured in terms of annual hours of work. They exploit the introduction of a government childcare subsidy, aimed at reducing the tax liability of US families.

Focusing on a sample of 749 women with young children from the US National Longitudinal Surveys of Labor Market Experience of Youth, their findings suggest that the childcare tax credit increased the annual number of hours worked by 5%. However, none of the studies looking at the determinants of hours worked have considered the role of the availability of different childcare arrangements and within household allocation of time.

Another strand of literature has focused on modelling labour market outcomes such as public versus private sector employment and temporary versus permanent employment. The choice between public and private sector employment, for example, has been investigated by Blank (1985), who estimated a probit model where the dependent variable took the value of one for public sector employment and zero for private sector employment. Focusing on a sample of 10,908 observations from the 1979 Current Population Survey, she found that high levels of education and job experience have a positive effect on the probability of working in the public sector. Similarly, Christofides and Pashardes (2002) estimated a probit model of public versus private-sector employment, focusing on a sample of 3,714 individuals from the Republic of Cyprus. They found that private-sector employment was negatively associated with age and positively associated with education and non-labour income. The presence of young children was not related to the decision of working in either the private or public sector.

Other studies have looked at the determinants of temporary employment. In a cross-sectional study, for example, Barbieri and Sestito (2008) estimated a probit model, using a sample of 200,206 employees from the Italian Labour Force Survey from 1994 to 2003. Their findings show that age, higher education and being married negatively affected the probability of being employed on a temporary basis. The probability of being in a temporary job was also lower in the North-West, as compared to the other regions. In a similar vein, Diaz and Sanchez (2008) investigated the determinants of temporary

employment in Spain using two different samples from the European Community Household Panel over the period 1995 to 2000. First, a probit model was used to estimate the probability of working on a temporary basis, focusing on a sample of 1,267 individuals aged from 16 to 65 years. Second, they estimated the same model based on a restricted sample of 711 women younger than 46 years old. They found that the probability of working on a temporary basis was positively related to age and negatively associated with both marriage and being female. However, these associations were only statistically significant in the restricted sample of individuals younger than 46.

One potential limitation of these studies is that they do not consider the role that childcare may play in the probability of being employed in a temporary job. In general, the relationship between childcare and different job attributes has received limited attention in the existing literature. Hence, we will use two measures of childcare (childcare arrangements during the mother's working time and childcare expenditure) to investigate the link with the aforementioned labour market outcomes.

3.3 Data and Methodology

3.3.1 Data

In order to explore the relationship between employment status and child care in Italy, we use data from the Sample Survey on Births, which is a cross-sectional study conducted by the Italian National Institute of Statistics (Istat) providing information on the social context of the newborns and the mother's employment before and after their pregnancy.

The survey focuses on children born in Italy approximately two years before the date of the interview. Questionnaires were administered to mothers who answered questions about household composition, the socioeconomic context in which they gave birth and their occupation both before and after the childbirth. Additionally, they were asked questions about the provision of childcare for the two-year-old child and the sharing of housework tasks within the household.

The sample population was stratified by region and the mother's age[33]. 168 stratums were created by combining the twenty Italian regions with eight age categories[34]. All the questionnaires were administered by the use of the CATI (Computer-assisted telephone interviewing) technique. This consists of a telephone surveying method in which interviewers are assisted by computer software in order to minimise the time of the interview.

The survey has been repeated three times. The first wave includes a sample of 15,553 mothers of those children who were registered at the civil registry between July 2000 and June 2001. The second wave includes a sample of 14,879 mothers whose children were registered at the civil registry in 2003. The final wave consists of the mothers of children registered between July 2009 and June 2010[35].

The three cross-sections are pooled to form the sample analysed. The total number of respondents was 48,148 but 4,670 observations were excluded from the analysis for a variety of reasons. Firstly, the focus of this study is on mothers whose current partner is the father of the child and lives with the family. This is because we are interested in the effects of how domestic work is shared between the couple on the woman's employment status. Secondly, we exclude 1,231 employed mothers who had not returned to work after childbirth. This absence may be due to several reasons, such as a new pregnancy or an injury that has prevented the return at work. Thirdly, women employed with a non-standard contract were also excluded due to lack of information regarding the employment type[36]. Finally, the selected sample was reduced to 42,231 observations after

[33] Sample weights were not made available by Istat for this dataset.
[34] The categories are: under 25, 25-27, 28-29, 30-31, 32-34, 35-36, 37-39, over 39.
[35] Since this period includes the financial crisis of 2008, we have carried out additional analysis where we separate the samples of two periods: 2002 and 2005 (before the crisis) and 2012 (after the crisis). The results relating to the main variables of interest remained qualitatively unchanged.
[36] The 'non-standard contract' category includes apprenticeships**,** home-workers and those women who were not able to identify their job in one of the standard categories. It also includes the so-called pseudo-employee (in Italian, lavoro parasubordinato) contracts, introduced with the Law of 10th September 2003. Legally, these workers are in an intermediate position between employees and self-employed workers. For

removing 1,210 observations due to missing values[37]. The aforementioned exclusions are detailed in Table 3.1.

The detailed information on the sharing of childcare provision and housework tasks, which is described in full below, makes this dataset particularly relevant for the study presented in this chapter. Given that the existing literature lacks information at this level of detail, the availability of such data is an important aspect of the contribution made by this chapter.

3.3.2 Estimation Models

The first model (model 1) explores the determinants of the probability that a woman is employed when the child is two years old. Following the literature (see Currie and Blau, 2004), this is based on a probit model where a value of one denotes that the woman is employed and zero if not employed. This model is estimated over the entire sample of 42,231 Italian mothers where 53.5% are employed (see Table 3.3). The probability that an individual i is working at the interview date is given by:

$$\Pr\ (empl_i = 1|x_i, z_i) = x_i'\beta + z_i'\gamma + u_i \tag{3.1}$$

where $empl$ denotes a dummy variable that is equal to if 1 if the mother is employed or self-employed and 0 if she is either unemployed or inactive[38]; x denotes a set of controls for the mother's and household characteristics; z contains information on the partner's

instance, they work within the firm as other employees but they have no relationship of subordination with the employer, as in the case of self-employed workers.

[37] The observations omitted due to sample exclusion restrictions constitute 9.7% of the surveyed individuals, whilst the missing values constitute 2.62% of the observations.

[38] We assume that unemployed and inactive women respond to incentives to enter the labour market in the same way. This is in line with recent literature. For example, Blackaby et al. (2007) estimated elasticities of the reservation wage and exit probability with respect to state benefits and the arrival rate of job offers, based on a sample of inactive individuals in the UK. They found their results to be very similar to other studies focusing on samples of unemployed individuals (e.g. Lancaster and Chesher, 1984; Narendranathan and Nickell, 1985).

engagement with childcare and the sharing of housework tasks; β and γ denote the parameter vectors, and u is the error term.

The second model (model 2) explores the determinants of the occupational attainment of the 22,556 women who are in employment. A multinomial logit model is employed where the outcome variable represents four different types of occupation: self-employed (19.2%), blue-collar (17.1%), white-collar (57.1%), and managerial (6.5%; the reference category)[39]. The probability of being employed in a certain occupation (model 2) is given by:

$$\Pr(occupation_i = k|x_i, w_i) = x_i'\beta + w_i'\delta + \varepsilon_i \quad (3.2)$$

where *occupation* is a categorical variable that ranges from 0 to 3 referring to the type of occupation (*k*); x includes controls for household characteristics; w denotes a set of variables regarding childcare and parental leave; β and δ denote the related vectors of the parameter estimates; and ε is the error term.

To analyse the occupational distribution of mothers we employ a multinomial logistic regression, in line with the existing literature (e.g. Brown et al., 1980). From a methodological point of view, we are aware that the sample of employed mothers is not a random sample from the entire population, and there are well known shortcomings from using standard econometric techniques (Wooldridge 2002). In particular, sample selection bias may arise when estimating the effect of childcare on female labour market outcomes if some of the variables affecting the decision to work also influence the labour market outcome analysed (see Vella 1998). To account for the potential sample selection, previous empirical studies have usually adopted the two-step approaches proposed by

[39] This classification of occupations is provided by Istat in the dataset.

Heckman (1979), which is designed for linear dependent variable models and relies on the normality assumption of the variable of interest. The application of this technique is not possible for the model of occupational attainment because our variable of interest, occupation, has multiple categories and is assumed to follow a logistic distribution[40].

A further extension of the analysis is the estimation of the determinants of four different labour market outcomes: number of hours worked (model 3); part-time employment versus full-time employment (model 4); being employed on a temporary contract versus being on a permanent contract (model 5); and private sector employment versus public sector (model 6). Model 3 is estimated for the subsample of 11,354 employed mothers who were in employment in 2002 and 2005[41]. In this sample, the mean number of weekly working hours is 30.3. The following linear model is employed to estimate the determinants of the number of hours worked (model 3):

$$hours_i = x_{hi}'\beta + w_i'\delta + \varepsilon_{hi} \tag{3.3}$$

where *hours* denotes the number of hours worked by a woman on a weekly basis; x_h includes controls for individual and household characteristics as described above, except the control for year 2012; *w* denotes a set of variables relating to childcare and parental leave; β and δ denote the related vectors of the parameter estimates; and ε_h is the error term. Due to the potential sample selection issue described above, we estimate model (3.3) by means of the two-step approach proposed by Heckman (1979). In particular, this

[40] Given the statistical issues with such an approach, we have also run the following model as a robustness check. In particular, we estimate simultaneously a multinomial probit model of occupational attainment (3.2) and a probit model of LFP (equation 3.1) using conditional maximum likelihood, as an attempt to account for the potential sample selection. The instrumental variables used in the first step to identify this model are as in z (in equation 3.1). Their validity is discussed below. In addition, we compare the results with those obtained estimating equation (3.2) with a simple multinomial probit model. The results (reported in Tables C.1 and C.2 in Appendix C) do not differ in terms of statistical significance and direction of the effects from the main model (Table 3.6).

[41] The information relating to hours worked was not reported in the third wave of the dataset in 2012.

model is estimated by adding a correction term that accounts for the predicted probability of being observed in the subsample of employed mothers, known as an inverse Mills' ratio, which in our model is obtained from model 1 (i.e. equation (3.1)). The instrumental variables used to identify the two-stage model are as in *z* (in equation 3.1) capturing the partner's engagement with childcare and the availability of individuals in the household to help with housework. Their validity is discussed below.

Models 4 to 6 are estimated for the subsample of 18,246 mothers working as employees (this excludes the 4,310 self-employed mothers for whom this information is not observed) in 2002, 2005, and 2012. In this sample, 41.95% of mothers have a part-time job, 16.35% have a temporary contract and 63.38% work in the private sector.

Models 4 to 6 are given by:

$$\Pr\ (pt = 1|x_i, w_i) = x_i'\beta + w_i'\delta + \ \varepsilon_{1i} \tag{3.4}$$

$$\Pr\ (temp = 1|x_i, w_i) = x_i'\beta + w_i'\delta + \ \varepsilon_{2i} \tag{3.5}$$

$$\Pr\ (privatesector = 1|x_i, w_i) = x_i'\beta + w_i'\delta + \ \varepsilon_{3i} \tag{3.6}$$

where *pt* takes the value of 1 if the woman is employed part-time or 0 if full-time; *temp* takes the value of 1 if the woman is employed on a temporary contract or 0 if permanent; *privatesector* takes the value of 1 if the woman works in the private sector or 0 if in the public sector; *x* includes controls for household characteristics; *w* denotes a set of variables relating to childcare and parental leave; β and δ denote the related vectors of parameters to be estimated; and ε_1, ε_2, ε_3 are the error terms. Models 4 to 6 are estimated using the maximum likelihood estimator for probit regression with sample selection provided by de Ven and Praag (1981). In this case, model 1 is used as a sample selection equation and the set of variables (z) are used for identification (this is discussed in detail in the next section).

3.3.3 Explanatory Variables

The choice of explanatory variables included in the six models is based on the existing literature. The vector *x* defined in equation (3.1) is a set of standard control variables included in the employment equation (model 1). Since the mother's characteristics such as age, race and education have been found by previous studies to affect both the probability of being employed and the amount of time spent in the labour market (see Blau and Robins, 1991; Kimmel, 1998; Apps and Rees, 2005; and Del Boca, 2002), we include this information in *x*. A set of dummy variables is used to control for the following age categories: under 24 (the omitted category), 25-29, 30-34, 35-39 and over 40. The dummy variable '*foreign'* refers to women whose nationality is not Italian. Since over 90% of immigrants in Italy come from less developed countries (Istat, 2015), this variable indicates a lower socioeconomic status.

To control for the mother's education, we use a set of three dummy variables capturing the highest level of education attained. First, '*Low Education'* (the reference category) refers to women with no formal education, primary education (usually attained at the age of 10) or junior high school certificate (usually between ages 11 and 14), which is comparable to the Key Stage 3 level of the UK system. Second, the '*Secondary school'* category refers to women who attained either a vocational diploma (3 years after junior high school) or a high school diploma (usually attained at the age of 19), and is comparable to the Key Stage 5 of the UK system. Third, '*High Education'* relates to women who attained a university degree (Bachelor, Masters or PhD).

Following the existing literature, we include a set of two variables relating to household composition. First, a continuous variable denotes the number of adults living in the household, other than the father of the child. Second, a set of three dummy variables is employed to account for the effect of having other children living in the household. Specifically, the variable '*Younger children'* indicates the presence of any children born

after the two-year-old child, '*Older children*' indicates the presence of children older than the two-year-old child. The '*Only child* variable (the omitted category) indicates that the mother only has the two-year old child.

To account for regional differences, we use a set of dummy variables that corresponds to the five official macro-areas used by Istat[42]. In particular, 'North-West' includes the regions of Piemonte, Lombardia, Valle d'Aosta and Liguria; 'North-East' includes the regions of Trentino Alto Adige, Veneto, Friuli Venezia Giulia, and Emilia Romagna; 'Centre' includes the regions of Toscana, Umbria, Marche, Lazio, Abruzzo and Molise; 'South' includes the regions of regions of Campania, Basilicata, Puglia, and Calabria; 'Islands' include Sicilia and Sardegna. This classification is also consistent with previous studies on Italy (see e.g. Del Boca et al, 2004).

In the standard neo-classical models of household behaviour, a woman maximizes her utility subject to a family budget constraint (which includes both family unearned income and the husband's earnings). These models are solved to derive the individual's demand for labour, which is a function of the family's nonwage income and the husband's earnings (see e.g. Blau and Robins, 1991; Kimmel and Connelly, 2007). Since information on earned and unearned income is not available for both the mothers and the mothers' household, we control for the financial situation of the family using two variables. Following Chiuri (2000) and Bredtmann (2014), we include '*house owner*' indicating whether the family owns the house where they live[43]. The variable '*family transfer*' is also included, which accords with Del Boca (2002). This variable takes the value of one if the woman reported receiving any informal financial assistance from relatives or friends during the first year of the life of their two-year-old child. In

[42] They also correspond to the five first-level NUTS (Nomenclature of Territorial Units for Statistics) regions, that is, the administrative division of the country used by the European Union.
[43] Due to data limitations, we are not able to differentiate between whether the house was owned outright or with an outstanding mortgage.

accordance with Chiuri (2000), the partner's occupation is employed as a proxy for the partner's earnings, since this information is not available in the data. In particular, we use the same categories as used for the mother's occupation (self-employed, blue-collar, white-collar and manager) and a reference category which includes partners not employed and partners employed with a non-standard contract[44]. Finally, a set of dummy variables 2002, 2005 and 2012 is employed to control for year.

Variables capturing the amount of childcare provided by the partner and the sharing of housework tasks within the household are included in equation (3.1) and they represent the set of over-identifying variables (z) for the sample selection corrections, as discussed below. As explained previously, individuals in a household allocate their time between paid work and unpaid activities, such as childcare and housework. However, since in Italy the unpaid work is often carried out mainly by women, an unequal gender share of domestic tasks within the household may affect the time allocation of the woman and her decision to enter the labour market (Duvander and Sundstrom, 2002). Therefore, we take the father's behaviour as given, which is also consistent with the theoretical framework of Beblo and Robledo (2008), in which a woman responds to the man's decision to work.

We create a childcare '*help index'* based on the help provided by the partner through four activities: the partner feeding the child; the partner playing with the child; the partner taking the child to nursery; and a final category grouping together other activities such as changing nappies, washing and dressing the child. These outcomes are used to create the index that goes from 0 to 4, corresponding to the number of activities in which the partner provides help. We have also estimated model specifications where a

[44] The percentage of mothers whose partner worked with a non-standard contract is small, representing 0.6% of the sample. The findings are robust to excluding them from the sample.

set of dummy variables for the four childcare activities (playing with child, feeding the child, taking the child to nursery and other childcare activities) was included.

A set of four dummy variables captures the effect of help with housework provided by one or more of the following people: the partner; own parents or the partner's parents; a professional cleaner; or any other individuals, such as relatives or friends.

The choice of instruments for estimating equations (3.3) - (3.6) is based on the existing empirical evidence, which suggests that a reduction in the hours of housework undertaken by women has a positive impact on their labour force participation (see e.g. Coen-Pirani et al. 2010; de V. Cavalcanti, and Tavares 2008). The statistical validity of the instrumental variables is discussed in Section 3.4.3 below.

As explained above, previous studies looking at the determinants of mothers' labour market outcomes have usually focused on measures of housework and childcare aggregated to the regional level. However, the use of household-level measures of childcare is arguably more consistent with the framework proposed by Becker (1965). In particular, the childcare *help index* is used as an indicator of the intensity with which the partner carries out primary childcare activities, which in turn may affect the mother's decision to enter the labour market.

In model 2, the occupational attainment model, we include variables that are expected to be related to the occupational attainment of mothers such as childcare and parental leave, along with the mother's and household's characteristics as described above (x).

There are two potential controls for childcare, which represent the set of variables (w) included in equations (3.1) - (3.6). The first is a set of dummy variables based on the responses to the question '*Who takes care of the baby when you work?*' The categories are the following: myself; partner; grandparents (the omitted category); babysitter; public

nursery school; private nursery school and other persons[45]. The second variable is the average real expenditure on childcare per month in Euros that the family pays for the aforementioned childcare arrangements[46]. Given the potential collinearity between the two child care variables, we run two versions of model 2 including each of the different approaches to control for child care separately. These controls refer to two different aspects of childcare. The childcare expenditure captures the effect of using paid forms of care, whilst the first approach captures the informal provision of childcare[47].

To control for parental leave, we use continuous variables capturing the optional period of paternity and maternity leave with the duration expressed in months[48]. In addition, the dummy variable *paidmatleave* equals one if the woman received pay during her maternity leave.

3.3.4 Summary Statistics

Summary statistics for the explanatory variables are given in Table 3.4. We define sample 1 as the entire sample of 42,231 mothers, sample 2 as the sub-sample of 22,556 mothers who were employed or self-employed and sample 3 as the sub-sample of 18,246 mothers who were employed. Women with a non-Italian nationality represent 2.9% of sample 1. As expected, this percentage is lower (1.6%) in samples 2 and 3, which is consistent with non-Italian women having lower socioeconomic status (Venturini and Villosio, 1998).

[45] These categories are mutually exclusive because they refer to the *main* childcare arrangement used by mothers. Hence, we cannot account for the use of mixed types of childcare.

[46] To deflate the care expenditure variable, we use a general price index for Italy provided by the Federal Reserve Bank of St. Louis where the base year is 2010.

[47] The Italian Survey on Births also contains information on hours of childcare provided for different childcare arrangements. However, this information is not available when the childcare was provided within the household (by the mother or father), and there was limited heterogeneity in the number of hours of childcare across the other childcare options, ranging between 29 and 33. Hence, we did not include childcare hours in the analysis presented below. We find that the results presented in the following section are robust to replacing the set of dummy variables with the measures based on hours.

[48] Parental leave in Italy is regulated by the law number 8 of March 2000. All employed mothers must suspend their activity for 3 months after the child's birth. During this period, they are entitled to receive 80% of their full salary. In addition to this compulsory 3 months, both parents can benefit from a supplementary and optional 6-month period of parental leave where duration cannot exceed 10 months. During the optional period they receive 30% of the full salary. The parental leave variables relate to this optional leave.

Since the sample is stratified by region and age classes, the distribution of these variables in sample 1 is representative of the national population[49]. Age in sample 1 is distributed as follows: 13.5% of women are below 25 years old, 23.7% are in the 25-29 class, 32.8% are in the 30-34 class, 21.8% are in the 35-39 class, and 8.8% are over 40 years old. Since the probability of working is positively correlated with age, women in sample 1 are younger, on average, than those in the sub-samples of employed mothers. In samples 2 and 3, less than 7% of women are younger than 25 years, whereas the percentage of women aged between 25 and 29 represented about 21.5%. Conversely, the categories where age is greater than 30 are more populated in the sub-samples of employed women: 36.5% of women are between 30 and 34 years old, 24.5% between 35 and 39 years old and approximately 10% are over 40 years old.

The geographical distribution of women in sample 1 is as follows: 18.4% live in the North-West of Italy, 20.6% live in the North-East, 24.1% live in Central Italy, 27.4% live in the South, and 9.5% live on the Islands. Since the northern regions are relatively more industrialised than the rest of the country, it is not surprising that half of the population in samples 2 and 3 live there. Conversely, the percentage of employed mothers who live in the South and on the Islands is relatively lower. Mothers whose region of residence is in the South of Italy comprise 18.3% of sample 2 and 17.1% of sample 3, whereas the percentage of working women who live on the Islands is 6.7% in sample 2 and 6.5% in sample 3. Finally, the percentage of mothers from Central Italy in samples 2 and 3 is also higher than for sample 1, making up 26.6% and 26.2%, respectively.

The women's level of education in sample 1 is distributed as follows: 27.1% of women are educated only to a low level, 51.2% have secondary school certification and 21.8% are highly educated. Since education is positively correlated with having a job, the

[49] Samples weights are not available in the data set.

percentage of mothers with low education is significantly smaller in the sub-samples of women with a job: women with a low level of education make up only 15.6% of sample 2 and 14.9% of sample 3; women with a secondary school education make up 52.4% of sample 2 and 54.2% of sample 3; and, finally, highly educated women make up 32% of sample 2 and 30.9% of sample 3.

The variables related to household composition are also summarised in Table 3.4. In sample 1, 43.9% of women only have one child whereas 52% of women reported having at least one other child older than the two-year-old. Only 4.1% of mothers reported having a child born after the two-year-old. Consistent with the argument that motherhood is a constraint on female labour force participation, the percentage of mothers with more than one child is lower for samples 2 and 3. In particular, the percentage of households with at least one child older than the two-year-old is 49.3% and less than 3% have a child born after the two-year-old. Conversely, the percentage of employed women with only one child is higher in the sub-samples of mothers with a job, representing 47.7% in sample 2 and 48.1% in sample 3. Finally, the mean number of other adults in addition to their spouse in the household is 0.1 for sample 1 and 0.07 for samples 2 and 3[50].

The percentage of home-owning households in sample 1 is 74.3%, while over 79% of households own their house in samples 2 and 3. Moreover, 15.8% of households receive financial support through relatives or friends in the previous year but only 13.1% of households in samples 2 and 3 received such help.

For the mothers in sample 1, the partner's occupation is distributed as follows: 5.2% are unemployed or employed with a non-standard contract, 31% are self-employed, 29.8% are blue-collar workers, 27% are white-collar workers, and 7% hold managerial positions. Consistent with the theory of positive assortative matching in the labour

[50] For more clarity, we also report here the percentage of mothers with at least one other adult in the household, which is 5.15% in sample 1, 4% in sample 2, and 3.9% in sample 3.

market, individuals tend to be married with partners who are in the same employment status, or hold a similar job position (Bredemeier and Juessen, 2013). For example, the percentage of unemployed partners is only 3.3% in both samples 2 and 3, that is, the sub-samples of employed mothers. As expected, self-employed partners make up 30.9% of sample 2 but only 25.8% of sample 3, where self-employed women are excluded from the analysis. Finally, the percentage of partners who are working as employees is higher in sample 3: in samples 2 and 3, partners with a blue-collar position are 24.9% and 27.3%, respectively; white-collar partners are 31.6% and 34.2%, respectively; and managers are 9.3% and 9.4% respectively.

The burden of housework is almost entirely experienced by women. In sample 1, only 11.7% of the women receive help from their partners, 6.2% receive help from their parents, 1.7% from other relatives or friends and 7.4% employ a cleaner. Partners who help with housework appear more frequently in sample 2 (15.6%) and in sample 3 (16.5%). Also, 11.25% of working mothers in sample 2 and 10% of women in sample 3 are helped by a professional cleaner.

Childcare appears to be provided mainly by women. However, partners in the sub-samples of employed mothers provide more help as compared to those in sample 1: the mean value of the childcare 'help index' is 2.59 in sample 1, 2.75 in sample 2 and 2.77 in sample 3.

Grandparents are the most common form of childcare used by the mother during her working time. In sample 2, 52.9% of children are left with their grandparents while the mother is working. Private and public nursery schools are another common form of childcare arrangement, representing 15% and 13.2% of the cases, respectively, whereas 8% of mothers entrust their children to a babysitter. In 7.1% of cases, the childcare arrangement is shared between the mother and father. Specifically, 4.76% of partners are the main provider of childcare while the mother was working and 2.38% of mothers take

care of the child themselves whilst working. Other types of childcare arrangements are less common, accounting for only 3.8% of the observations. For mothers in sample 3, these percentages are almost identical.

The average monthly expenditure for childcare is almost identical for mothers in sample 2 and mothers in sample 3, being €145.9 and €146.1, respectively. As mentioned above, a degree of correlation exists between childcare expenditure and the different care options. In particular, the average household monthly expenditure for public and private nursery schools is 298€ and 334.6€, respectively, whereas parents who hire a baby-sitter spend, on average, 500.5€. If childcare is provided by grandparents the expenditure is approximately 22€, whereas other childcare options cost, on average, 140€ per month. Finally, the expenditure is zero if childcare is provided directly by the parents.

The mean values of the optional maternity and paternity leave are also reported for samples 2 and 3. The average duration of maternity leave is 2.79 months in sample 2 and 3.42 months in sample 3, indicating that the period of maternity leave is shorter for self-employed mothers. Conversely, the duration of paternity leave is 0.07 months in sample 2, which is higher than the 0.04 months for partners in sample 3. Finally, the percentage of mothers receiving pay during maternity leave is 63.2% in sample 3 and 51.4% in sample 2.

3.4 Results

In this section, we present the results for the models described above (models 3.1 to 3.6). Although the existing literature has shown that a casual effect exists between childcare, housework and a mother's labour market outcomes (Stolzenberg and Waite, 1984; Coen-Pirani et al., 2010, Rammohan and Whelan 2007), it is important to acknowledge that all of the results presented in this chapter represent associations rather than causal relationships.

3.4.1 The Labour Force Participation Model

Table 3.5 shows the average marginal effects relating to the probability of being employed, relative to the probability of being either unemployed or inactive, two years after pregnancy. In accordance with foreign mothers having a lower socioeconomic status, they are 24.3 percentage points (pp) less likely to have a job, compared to Italian mothers. This is consistent with Venturini and Villosio (1998). Relative to young mothers (less than 24 years old), older mothers are more likely to be employed; this is consistent with the findings in the literature (see, for example, Kalinkoski et al. 2005).

In accordance with the existing literature (see for example, Leibowitz et al., 1992; van den Brink and Groot, 1997), education is positively related to labour force participation. Mothers with a secondary school diploma and highly educated mothers are respectively 15.1 and 32.2pp more likely to be working compared to low educated mothers.

In keeping with van den Brink and Groot (1997) and Kalinkoski et al. (2005), the presence of other adults and the presence of children in the household are inversely related to the probability of employment relative to be unemployed or inactive. An additional adult in the household is associated with mothers being 2.2pp less likely to be employed. The probability of employment (relative to being either inactive or unemployed) is 17.2pp lower if the woman has a child younger than two and 9.7pp lower if she has at least one child older than the reference child.

The regional dummy variables capture the differences in regional unemployment rates and different levels of industrial development. As mentioned above, the omitted category is represented by the variable South, which is the less prosperous area, along with the Islands. In fact, women from the Islands are only 1.5pp more likely to be employed compared to women who live in the South. The North-East and North-West regions generally have higher levels of per-capita income and relatively low

unemployment rates. In fact, in these regions, mothers are respectively 20.9 and 23.2pp more likely to work than mothers who live in the South, whereas the probability of employment is 15.8pp higher for women living in the Centre of Italy.

Compared with mothers whose partners are unemployed, having a working partner is positively associated with the probability that the mother is employed relative to not being employed. Specifically, the probability of working is 4.6pp higher when the partner holds a white-collar position. In line with Chiuri (2000), mothers whose partners are blue-collar workers, managers or self-employed are 2pp more likely to be employed relative to being either employed or inactive.

In keeping with Bredtmann (2014), mothers are 4.7pp more likely to be employed after pregnancy if the house where they live is owned by the family. Conversely, receiving financial help from parents or other relatives is negatively associated with the likelihood of being employed by 7.9pp.

As discussed previously, the effect of the mother receiving help with housework and primary childcare on her labour force participation is expected to be positive (see de V. Cavalcanti, and Tavares, 2008; Coen-Pirani et al., 2010). Women who usually receive help from their parents or other relatives are respectively 7.1 and 7.9pp more likely to work relative to being either employed or inactive. The contribution of the partner's help is even more important in influencing the probability of employment of mothers, being 12.3pp higher when they receive help from their partner. Finally, mothers are 18.9pp more likely to be employed if the household hires a professional cleaner.

Similar to the results for housework, a partner's help with childcare also plays an important role in the mother's probability of being in employment relative to not being

employed. In fact, the mother's likelihood of being employed is 5pp higher for each extra childcare activity carried out by the father[51].

Finally, the number of women employed in the Italian labour market increased from 8.6 to 9.4 million over the period 2002-2012 (Istat, 2016) and this increase is reflected in the estimated effects of the year controls, 2005 and 2012. Compared to 2002, mothers interviewed in 2005 and 2012 are respectively 1 and 2.2pp more likely to work.

3.4.2 The Occupational Attainment Model

Table 3.6 shows the relative risk ratios (RRR) estimated for model 2. This model includes additional controls for different childcare arrangements during the mother's working time[52].

Foreign mothers are found to have a greater probability of holding a blue-collar position relative to a white-collar position but are less likely to be in the manager category. In addition, being foreign is not associated with the probability of being self-employed.

Age is inversely related to the likelihood of being employed as a blue-collar worker (relative to working as a white-collar worker) and this is in line with Kidd (1993), who found a positive relationship between a woman's experience in the labour market and her probability of being employed in administrative positions. Age is found to be positively associated with the probability of being in management, which may reflect the

[51] In this model, we assumed linearity in the relationship between childcare and LFP. However, we have also estimated model specifications where a set of dummy variables for the four childcare activities (playing with child, feeding the child, taking the child to nursery and other childcare activities) was included. We found that playing with the child was negatively associated with the LFP of mothers, whereas the other childcare activities were positively related to the probability of being employed two years after the childbirth. In addition, taking the child to the nursery had a larger association with a mother's LFP, compared to other activities.

[52] The model of occupational attainment is estimated using a multinomial logit model, in line with previous literature. As explained above, we have also estimated equations (3.1) and (3.2) simultaneously using conditional maximum likelihood, to account for potential sample selection. In addition, we compare these results with those obtained estimating equation (3.2) with a simple multinomial probit model. The results (reported in Tables C.1 and C.2 in Appendix C) do not differ in terms of statistical significance and the direction of the effects.

fact that managerial positions are likely to be held by more experienced workers. Finally, the results suggest a statistically insignificant association between age and self-employment.

For each extra adult in the household, mothers are more likely to hold either a self-employed or a blue-collar position as compared to a white-collar position. In addition, the probability of being a manager is unrelated to the presence of additional adults in the household. Having a child younger than two years is positively associated with the probabilities of holding either a self-employed or a managerial position, but unrelated to the probability of holding a blue-collar job. Having one or more children older than the reference child is not related to the type of occupation held by the mother.

In line with the literature on positive assortative mating in the labour market (Bredemeier and Juessen, 2013), women are more likely to be married or cohabiting with partners who hold the same job position. An inverse association is found between owning a house and having a blue-collar job but there is no statistically significant difference for managers and self-employed workers. Finally, receiving financial assistance is positively related to the probability of being a blue-collar worker, but unrelated to the remaining categories of occupation.

The probability of being self-employed (relative to being a white-collar worker) appears to be unrelated to region of residence. In fact, there is only a statistically significant (and negative) association between the Islands and the probability of being self-employed. The probability of holding a blue-collar position is lower for women living on the Islands and in the northern regions, but unrelated to living in Central Italy. The probability of belonging to the managerial category is found to be unrelated to the region of residence.

Compared to women interviewed in 2002, women interviewed in 2012 are less likely to be self-employed, when compared to those who are in white-collar positions

(results not shown in the table). Being interviewed in 2005 or 2012 is not statistically significantly related to being in blue-collar employment, as compared to being in white-collar employment. Conversely, being interviewed in 2005 or 2012 is inversely related to the probability of being a manager, as compared to holding a white-collar position.

An inverse relationship is found between receiving pay during maternity leave and the likelihood of holding a blue-collar position relative to the probability of holding a white-collar position. For self-employed mothers, the relative risk ratio is small and close to zero reflecting the fact that self-employed mothers rarely receive any form of pay during their maternity leave. Finally, the probability of being a manager relative to being white-collar is not statistically significantly associated with receiving pay during maternity leave.

An extra month of optional maternity leave is associated with a greater probability of belonging to the blue-collar category and a lower probability of being self-employed relative to being a white-collar worker. On the other hand, there is a statistically insignificant association between maternity leave duration and being a manager relative to holding a white-collar position. The results also suggest that non-compulsory paternity leave can be particularly important for a woman's career as measured by occupation. In fact, an additional month of paternity leave is associated with a greater likelihood of being either self-employed or employed as a manager, relative to being a white-collar worker. In addition, the probability of being employed as a blue-collar worker is not related to the duration of paternity leave.

As expected, the self-care option is used mainly by self-employed mothers, whereas it is unrelated to the other occupation categories. An alternative childcare option used by self-employed women is the babysitter arrangement, whereas other childcare solutions have a statistically insignificant association with the probability of being self-employed (relative to the probability of being a white-collar worker). Blue-collar mothers

tend to make use of low-cost childcare arrangements. For example, the option partner providing care is positively associated with the probability of holding a blue-collar position (as compared to holding a white-collar position). However, nursery school and babysitters are used relatively less by blue-collar workers, compared to white-collar ones. Babysitters are the option that is used the most by managers, whereas there is a statistically insignificant association between the use of a nursery school and the probability of being employed as a manager. The fact that women in management tend to rely on the babysitter option may be due to the fact that they tend to work more out of standard working hours and need to rely on flexible forms of childcare, compared to public and private nursery schools whose opening times are extremely rigid (Del Boca, 2002; Chiuri, 2000). In 2011 8.1% of Italian mothers did not send the child to the nursery school for reasons such as the inconvenience of opening hours and distance of the nursery schools (Istat, 2012). Finally, the probability of having a managerial role is negatively associated with the 'partner care' option, but unrelated to the self-care option.

The estimates for real childcare expenditure which accord with expectations are reported in Panel B of Table 3.6. A one-percent increase in childcare expenditure is inversely associated with the probability of holding a blue-collar role by a factor of 0.939, as compared to a white-collar role. The probability of being a manager is positively associated with childcare expenditure (with an increasing factor of 1.029) while the association with self-employment is not statistically significant.

3.4.3 The Determinants of Mothers' Job Attributes

In this section, we report the results relating to the determinants of four different job attributes: the number of hours worked, part-time versus full-time employment, public versus private-sector employment, and temporary versus permanent employment. This analysis is based on the sample of mothers working as employees (female self-employment will be discussed in detail in Chapter 4).

For these models, we present a set of selected results relating to the key variables of interest, namely household composition and childcare[53]. We discuss the results for the determinants of hours worked in a separate sub-section. This analysis is based on a different sample because information on hours worked is not available in 2012.

3.4.3.1 Number of Hours Worked

Table 3.7 reports the estimated coefficients of the explanatory variables related to modelling the number of hours worked per week (model 3), and including the sample selection correction[54]. Two different specifications have been estimated for this model: one including controls for childcare availability (the results are presented in Panel A of Table 3.7) and one including childcare expenditure (see Panel B of Table 3.7). In both specifications, the coefficient of the inverse mills ratio is found to be positive and statistically significant, confirming the presence of sample selection bias[55].

Regarding household composition, women are found to work on average 0.3 hours more, for each additional adult living in the household. We do not find a significant difference in the hours worked between mothers who only have a two-year old child and women who also have a child after the reference child. Consistent with Del Boca and Vuri (2007), mothers with at least one child older than the reference child are found to work, on average, 0.9 hours less than women with an only child. This result may suggest that

[53] The results relating to the other control variables are in line with previous literature and, hence, for brevity are not presented.

[54] As explained above, the help index and housework variables are used as instruments in the first-stage regression. The validity of these over-identifying variables is confirmed statistically. When we include housework and partner's help in the employment equation (model 1), their marginal effects are positive and statistically significant. On the other hand, their effects are not statistically significant if included in the model of hours worked (model 3.3).

[55] As a robustness check, we also estimated two separate models, for the samples of part-time and full-time employed. In this case, the sample selection corrections were based on a multinomial model with the dependent variable going from 0 to 3 (non-employed, part-time employed, full-time employed), and included in the second stage equations, as suggested by Lee (1983). The inclusion of the correction terms was significant for the samples of full-time employed, but insignificant for the case of part-time employed. Furthermore, these results were consistent with those presented in Table 3.7.

having a greater number of children may further limit the time that mothers can devote to labour market activities.

Considering the childcare options, the mother's labour supply is, respectively, 0.8 and 1.1 hours higher when the main childcare provider is either a public or private nursery school. The number of hours worked by mothers who use the babysitter as the main childcare arrangement and by mothers who take care of the child themselves do not differ to those who rely on grandparents. In addition, a mother's labour supply is 0.9 hours lower when the partner takes care of the child during the mother's working hours.

In general, these results suggest that Italians mothers tend to work more hours if formal childcare arrangements are available. This is confirmed by Panel B, showing that a one-percent increase in the real childcare expenditure is positively associated with an increase in the number of hours worked by 0.2 hours.

3.4.3.2 The Determinants of Other Job Attributes: Part-Time, Private-Sector and Temporary Contract Employment

Table 3.8 presents selected results for the models (3.4) - (3.6), exploring the determinants of job attributes captured by the following binary variables: part-time employment versus full-time employment, temporary versus permanent contract employment and private versus public sector employment. Each of these models are estimated with the maximum likelihood estimator for probit regression with sample selection provided by de Ven and Praag (1981), to control for potential sample selection. The selection equation (LFP model) is given by the equation (3.1).

Table 3.8 reports a selected set of results relating to the key explanatory variables of interest for this study, namely household composition, and childcare. The results relating to the other explanatory variables are in line with the existing literature.

Women with a child younger than the reference child are 6.5 percentage points (pp) less likely to have a part-time job relative to being full-time workers, while the

presence of older children in the household is related to an increase in the probability of holding a part-time job by 4.5pp. These results are in line with Rammohan and Whelan (2007), and Cai and Law (2014), who found that the presence of children in the household influences a mother's probability of working either part-time or full-time. An extra adult in the household reduces the likelihood of having a part-time job by 2.6pp, potentially capturing the supportive role of these individuals towards the family.

Having other adults in the household and children younger than the age of two is statistically insignificantly related to the probability of private-sector employment relative to being employed in the public sector. However, the probability of working in the private sector is 7pp lower for those mothers who have one or more children older than the reference child.

The probability of being employed on a temporary contract (relative to permanent contract employment) is inversely associated with having a child younger than the two-year-old in the household, but positively associated with having at least one child older than the reference child. This could indicate that mothers tend to have children when they have a stable job. In addition, we found the presence of an additional adult in the household to be unrelated to the probability of temporary work.

The results relating to the link between the main childcare option used by the family and part-time work are similar to the findings of Connelly and Kimmel (2005), showing that part-time workers tend to rely less on formal childcare options and more on informal care arrangements. For example, we find a positive association between the partner childcare option and the mother working on a part-time basis. This may be due to a positive assortative mating effect, whereby women with a part-time job tend to marry or cohabit with men who have the same type of contract. We also find a statistically insignificant relationship between the probability of working part-time and the 'self-care' option. On the other hand, the public and private nursery school options are associated

with a lower probability of working part-time by, respectively, 2.8 and 3.1pp. Similarly, mothers with a part-time job are less likely to use a babysitter as the main childcare option whereas other childcare arrangements have a statistically insignificant effect. Finally, the estimate for real care expenditure detailed in Panel B of Table 3.8 suggests that a one-percent increase in real childcare expenditure is associated with a decrease by 0.8pp in the probability of working on a part-time basis.

The probability of working in the private sector (relative to working in the public sector) is found not to be associated with the self-care and the private nursery school options. Women who make use of either a babysitter or a public nursery school are less likely to be employed in the private sector relative to public sector employment, respectively, by 3.1 and 1.9pp. Also, a negative relationship is found between the probability of working in the private-sector and the partner-care option. Finally, the probability of working in the private sector is found not to be associated with childcare expenditure (see Panel B, Table 3.8).

The self-care and nursery school options are not statistically significantly related to the probability of having a temporary job relative to working with a permanent contract. However, using a babysitter as the main arrangement during the mother's working time is associated with a decrease in the probability of working on a temporary contract relative to working with a permanent contract by 1.9pp. Women using partners or other arrangements for the main childcare option are more likely to be employed on a temporary basis and the increase is by 2 and 2.7pp, respectively. Finally, Table 3.8 (Panel B) presents the estimates for the childcare expenditure elasticity. We find that an increase in real childcare expenditure is negatively associated with the mother's probability of being employed on a temporary basis by 0.4pp.

3.5 Conclusion

In this chapter, we have used the Italian Sample Survey on Births to investigate the effects of childcare and housework on female labour force participation. We have also analysed the relationship between child care and a wide range of different labour market outcomes, such as occupational attainment, the number of hours worked, the type of contract (part-time versus full-time, and temporary versus permanent employment), and sector of employment (private sector versus public sector employment).

Gaining a greater understanding of the aforementioned relationships is important for several reasons. First, the Italian labour market is characterized by a low female employment rate and this has been associated with the fact that women are the main providers of domestic work in the household. Second, the unavailability of childcare constrains the time that a woman can dedicate to the labour market, with a consequent limitation on the possibility of reaching supervisory and managerial positions (European Commission, 2007). Finally, the absence of affordable childcare services may also affect other aspects of a mother's career. For example, after having a child a woman may be forced to stay out of the labour market for several months, with a subsequent increase in the probability of re-entering the labour market with a temporary job (Gagliarducci, 2005).

The contribution of this study to the existing literature is threefold. Firstly, the Sample Survey on Births contains detailed information on childcare and housework help. We have used this information to create a measure of the partner's engagement with different childcare activities and a set of variables indicating the channels through which the mother received help with housework. Secondly, we are not aware of previous attempts to investigate the link between childcare and the occupational attainment of mothers. To do this, we used a set of variables describing the main childcare arrangement used by the family to look after the child during the mother's working time. Finally, we

analysed different job attributes, focusing on the role of the above mentioned childcare options.

The findings suggest that the mother's probability of entering the labour market is positively associated with the partner's engagement with domestic work. Mothers whose partners help with four different childcare activities are 20 percentage points more likely to be employed. Similarly, the probability of being employed is 12.3 percentage points higher if the partner is usually involved in housework tasks. These results are in line with the hypothesis that female labour force participation is constrained by domestic responsibilities.

Regarding occupational attainment, self-employment appears to be an option that mothers use to reconcile family and working life, with the probability of self-employment being positively associated with the mother taking care of the child herself during working time. In the following chapter, we will investigate in detail the relationship between household composition and different types of self-employment, and the link between household composition and hours worked by self-employed women. Among the employed in the sample, the probability of being employed as a blue-collar worker is inversely associated with the use of paid childcare arrangements (babysitter, public and private nursery school). Conversely, the probability of being in a managerial position is positively associated with the use of a babysitter but it is not related to the use of nursery schools. This may be due to two reasons. Firstly, access to public nursery schools is limited for high-income families[56]. Secondly, since opening hours of nursery schools in Italy are generally rigid, women may need to rely on more flexible forms of childcare.

[56] The access to nursery schools in Italy is organized at a municipal level with ranking lists (see e.g. Comune di Milano webpage (http://www.comune.milano.it)). Families can choose the nursery school where they want to send their child (based on proximity to their house) and participate in a ranking list. They are selected based on their income and the availability of places in the nursery.

Thirdly, we also found the duration of paternity leave to be positively associated with the mother's probability of being either self-employed or a manager.

Interestingly, we have found a link between childcare and a mother's type of job. In fact, the use of paid childcare (such as childminders and nursery schools) and childcare expenditure were found to be inversely related to the probability of being employed in forms of employment such as part-time and temporary-contract employment. In contrast, mothers who use informal childcare arrangements available within the family (such as the partners) were found to be more likely to be employed on a part-time basis, and with a temporary contract.

Some policy implications can be drawn from these results. First, making formal childcare more affordable may help unemployed mothers to enter the labour market. At the same time, such a measure may allow employed mothers to increase the number of hours worked outside their home, with potential benefits including the possibility of attaining better job positions. Second, the way childcare is provided by nursery schools, in terms of the number of hours and time flexibility, might be incompatible with holding managerial roles. Hence, the attainment of these positions may be facilitated by subsiding supplementary forms of childcare, such as after-school activities. Third, the attainment of a managerial role or the possibility of running a business may be facilitated by family-friendly measures such as paternity leave benefits. Fourth, childcare subsidies may also affect the quality of a mother's job if they are aimed at making the working life more compatible with caregiving responsibilities, especially in the earliest years of a child's age. It is worthwhile noting that the Italian government introduced in 2012 a form of financial aid aimed at employed mothers for the purchase of baby-sitting services during the first year of life of their children[57]. The effects of this subsidy on a mother's

[57] This was introduced by the Law Number 92 of 28 June 2012.

occupational attainment and different measures of job quality may be interesting areas for future research.

From a methodological point of view, a weakness of this analysis can be attributed to the use of cross-sectional data. In fact, the availability of panel data may help to eliminate the risk of potential reverse causation that may arise when estimating the effect of childcare and housework on a mother's labour market outcomes. However, detailed information on the intra-household division of domestic labour for Italy is currently only available in the form of cross-sectional data.

Another possible critique is that this chapter focuses on availability of childcare rather than exploring the issue of childcare affordability, due to the lack of information on childcare prices for Italy. However, this issue was at least partially explored here, when comparing unpaid (or relatively cheap) childcare arrangements, such as grandparents, with paid forms of childcare, such as nursery schools and babysitters. It is apparent that for future research in this area addressing the current unavailability of individual panel data on mothers and information on child care prices would be an important move in the right direction.

Finally, it is important to acknowledge another potential issue. The present chapter analyses different labour market outcomes focusing on partnered mothers as we are interested in the intra-allocation of household work within couples. However, omitting the sub-sample of single mothers may expose the analysis to a potential selection problem as single mothers may be particularly affected by the unavailability of childcare and help with housework.

3.6 Tables

Table 3.1 - Sample exclusions and missing values

	Observations	Percentage of the total surveyed
Total number of observations	48,111	100%
Exclusions		
If father does not live in the house or has died	1,541	3.20%
If mother is employed but has not gone back to work after pregnancy	2,132	4.43%
Internships, 'pseudo-employee' contracts and workers who fall into the 'other category'	1,082	2.25%
Total number of observations lost	4,670	9.70%
Total number of usable observations	43,441	90.3%

	Observations	Percentage of the total surveyed
Total number of mothers with a two-year-old child	43,441	100%
Missing values		
Foreign mother	1	0.00%
Child care	4	0.01%
Mother's occupation	53	0.12%
Younger children	1	0.00%
Mother's education	14	0.03%
Family transfers	67	0.15%
Maternity duration	6	0.02%
Paternity duration	188	0.43%
Paid maternity leave	9	0.02%
Partner's employment status	85	0.20%
Real childcare expenditure	219	0.5%
Partner's occupation	179	0.41%
Total number of missing values	1,210	2.51 %
Total number of usable observations	42,231	97.49% %

Table 3.2 - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
Outcome variables		
Employed	empl	Binary variable (0 -1). 1 if not employed at the interview date; 0 otherwise.
Mother's occupation	occupation	Categorical variable (0, 1, 2, 3). 0 if mother is self-employed; 1 if mother is a blue-collar worker; 2 is a white-collar worker, 3 if mother is manager.
Hours worked	hours	Continuous variable. Number of hours worked
Part-time	pt	Binary variable (0 -1). 1 if employed on a part-time contract; 0 if full-time.
Private sector	privatesector	Binary variable (0 -1). 1 if employed in a private sector; 0 if public sector.
Temporary contract	temp	Binary variable (0 -1). 1 if employed on a temporary contract; 0 if permanent.
Explanatory Variables		
Vector X (included in all equations)		
Low Level of Education Attained	loweducation	Binary variable (0 -1). 1 if the highest level of education attained by the mother is primary school; 0 otherwise.
Middle Level of Education Attained	secondaryschool	Binary variable (0 -1). 1 if the highest level of education attained by the mother is a high school diploma; 0 otherwise.
High Level of Education Attained	higheducation	Binary variable (0 -1). 1 if the highest level of education attained by the mother is a university degree; 0 otherwise.
Foreign	foreignm	Binary variable (0 -1). 1 if nationality is Italian; 0 if the nationality is different from Italian.
South	south	Binary variable (0 -1). 1 if mother is resident in one of the four Southern regions (Campania, Basilicata, Puglia, Calabria); 0 otherwise.
Centre	centre	Binary variable (0 -1). 1 if mother is resident in one of the six central Regions (Toscana, Umbria, Marche, Lazio, Abruzzo, Molise); 0 otherwise.
Islands	islands	Binary variable (0 -1). 1 if mother is resident in either Sicilia or Sardegna; 0 otherwise.
North-East	northeast	Binary variable (0 -1). 1 if mother is resident in the North-East (Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna); 0 otherwise.
Age (25-29)	25-29	Binary variable (0 -1). 1 if mother's age is between 25 and 29; 0 otherwise.
Age (30-34)	30-34	Binary variable (0 -1). 1 if mother's age is between 30 and 34; 0 otherwise.
Age (35-39)	35-39	Binary variable (0 -1). 1 if mother's age is between 35 and 39; 0 otherwise.
Age (Over 40)	over40	Binary variable (0 -1). 1 if mother's age is greater or equal to 40; 0 otherwise.
Other adults in the household	otheradults	Continuous variable. Number of other adult relatives or friends in the household
Only Child in the household	onlychild	Binary variable (0 -1). 1 if there is only one child in the household; 0 otherwise.
Older Children present in the household	olderchildren	Binary variable (0 -1). 1 if the child has got at least one older sibling; 0 otherwise.
Younger Children present in the household	youngerchildren	Binary variable (0 -1). 1 if the child has got at least one younger sibling; 0 otherwise.

Table 3.2 (continued) - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
Manager Partner	managerfath	Binary variable (0 -1). 1 if partner is employed as a manager at the interview date; 0 otherwise.
White-Collar Partner	whitecollarfath	Binary variable (0 -1). 1 if partner is employed as an office worker at the interview date; 0 otherwise.
Blue-Collar Partner	bluecollarfath	Binary variable (0 -1). 1 if partner is employed as a Blue-collar worker at the interview date; 0 otherwise.
Self-employed Partner	selfempfath	Binary variable (0 -1). 1 if partner is self-employed at the interview date; 0 otherwise.
House owner	houseowner	Binary variable (0 -1). 1 if the household owns the house where they live; 0 otherwise.
Family transfer	familytransf	Binary variable (0 -1). 1 if the family received any money transfer from the family during the first year of life of the child; 0 otherwise.
Mother gets paid for days off	mothergp	Binary variable (0 -1). 1 if the mother receives pay in case she has to take a day off to take care of the child; 0 otherwise.
Paid maternity leave	paidmatleave	Binary variable (0 -1). 1 if the maternity period was paid, 0 otherwise.
Maternity duration	matduration	Continuous Variable. Maternity leave duration in months.
Paternity duration	patduration	Continuous Variable. Paternity leave duration in months.
Vector Z (included in equation 3.1)		
Partner childcare		
Partner feeds the child	feedhelp	Binary variable (0 -1). 1 if partner helps by feeding the child; 0 otherwise.
Partner helps with other activities	carehelp	Binary variable (0 -1). 1 if partner helps with different activities (changing the nappy, washing/dressing the child); 0 otherwise.
Partner plays with the child	playhelp	Binary variable (0 -1). 1 if partner helps by playing with the child; 0 otherwise.
Partner brings the child to the nursery	nurseryhelp	Binary variable (0 -1). 1 if partner brings/picks up the children from nursery school; 0 otherwise.
Help index	helpindex	Ordered categorical variable (0, 1, 2, 3). 0 if partner does not help with any of the above activities; 1 if partner helps with only of the above activities; 2 if partner helps with only two of the above activities; 3 if partner answer to at least three of the above activities
Partner Housework	partnerh_work	Binary variable (0 -1). 1 if partner helps with house work; 0 if partner does not help with housework.
Parents Housework	parentsh_work	Binary variable (0 -1). 1 if at least one of the grandparents of the child help with the house work; 0 if none of the grandparents help with housework
Professional cleaner Housework	cleanerh_work	Binary variable (0 -1). 1 if a professional cleaner helps with house work; 0 if no cleaner help with housework.
Other Housework	otherh_work	Binary variable (0 -1). 1 if any other person (other relatives, friends, etc.) helps with house work; 0 otherwise.

Table 3.2 (continued) - Definition of the variables used in the main analysis

Vector W (included in equations 3.2 - 3.6)		
Childcare		
Child care provided by the Mother	selfcare	Binary variable (0 -1). 1 if mother takes care herself of the child while she is working; 0 otherwise.
Child care provided by the Partner	partnercare	Binary variable (0 -1). 1 if the partner is the main provider of childcare when the mother is working; 0 otherwise.
Child care provided by Babysitter	babyscare	Binary variable (0 -1). 1 if a babysitter is the main provider of childcare when the mother is working; 0 otherwise
Child care provided by a Nursery school	nursery	Binary variable (0 -1). 1 if nursery school is the main provider of childcare when the mother is working; 0 otherwise.
Child care provided by Others	othercare	Binary variable (0 -1). 1 if any other individuals provide with childcare when the mother is working.
Real childcare expenditure	realcareexp	Continuous Variable. Real expenditure in childcare per month in Euros.

Table 3.3 - Summary statistics for each estimation sample; dependent variables

	(1) **Sample of all mothers**	(2) **Sample of the working mothers**	(3) **Sample of employed mothers**
Dependent variables	Percent (%)	Percent (%)	Percent (%)
Employed	53.49	-	-
Self-employed	-	19.12	-
Manager	-	6.50	-
White-collar	-	17.15	-
Blue-collar	-	57.23	-
Part-time	-	-	41.95
Temporary contract	-	-	16.35
Private sector	-	-	63.38
Observations	42,231	22,556	18,246

NOTES: Sample 3 excludes self-employed mothers

Table 3.4 - Summary statistics for each estimation sample; explanatory variables

	(1) Sample of all mothers				(2) Sample of the working mothers				(3) Sample of the employed mothers			
Observations	42,231				22,556				18,246			
Explanatory variables	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
help index	2.59	0.88	0	4	2.75	0.96	0	4	2.77	0.96	0	4
other adults	0.10	0.47	0	11	0.07	0.39	0	9	0.07	0.38	0	7
maternity duration	-	-	-	-	2.79	3.63	0	29	3.42	3.73	0	29
paternity duration	-	-	-	-	0.07	0.45	0	6.90	0.04	0.28	0	6.90
real expend (ihs)	-	-	-	-	2.64	3.16	0	8.53	2.67	3.16	0	8.53
Explanatory variables	Percent (%)				Percent (%)				Percent (%)			
foreign born	2.96				1.61				1.58			
Region												
northwest	18.37				23.31				23.89			
northeast	20.59				25.14				26.34			
centre	24.10				26.64				26.23			
south	27.43				18.25				17.05			
islands	9.51				6.67				6.49			
Age												
under24	13.48				6.95				6.86			
25-29	23.74				21.49				21.67			
30-34	32.82				36.49				36.48			
35-39	21.15				24.80				24.64			
over40	8.80				10.27				10.36			

NOTES: Sample 3 excludes self-employed mothers

Table 3.4 (continued) - Summary statistics for each estimation sample; explanatory variables

	(1) **Sample of all mothers**	(2) **Sample of the working mothers**	(3) **Sample of the employed mothers**
Observations	42,231	22,556	18,246
Explanatory variables	Percent (%)	Percent (%)	Percent (%)
Education			
low education	27.10	15.60	14.88
secondary school	51.15	52.41	54.22
high education	21.75	31.98	30.90
Household composition			
younger children	4.12	2.97	2.64
older children	52.00	49.36	49.24
only child	43.88	47.67	48.12
Financial status			
house owner	74.29	79.33	79.76
family transfer	15.82	13.10	13.13
Partner's employment status			
managerpartn	7.01	9.26	9.38
whitecollarpartn	29.82	24.91	27.33
bluecollarpartn	26.97	31.58	34.24
selfemppartn	31.03	30.92	25.81
nonemployedpartn	5.17	3.33	3.24

NOTES: Sample 3 excludes self-employed mothers

Table 3.4 (continued) - Summary statistics for each estimation sample; explanatory variables

	(1) **Sample of all mothers**	(2) **Sample of the working mothers**	(3) **Sample of the employed mothers**
Observations	42,231	22,556	18,246
Explanatory variables	Percent (%)	Percent (%)	Percent (%)
Housework			
partner	11.73	15.58	16.50
parents	6.24	6.29	6.38
other	1.70	1.71	1.55
cleaner	7.35	11.25	9.99
Childcare			
self-care	-	2.43	0.98
partner	-	4.88	5.13
grandparents	-	52.90	53.70
baby sitter	-	7.92	7.63
public nursery	-	13.09	13.70
private nursery	-	14.95	15.03
other	-	3.79	3.82
Parentale leave			
paidmatleave	-	51.39	63.19
Partner's childcare (activities)			
Feeding the child	75.61	-	-
Taking care of the child	79.78	-	-
Play with child	86.77	-	-
Taking child to the nursery	17.38	-	-

NOTES: Sample 3 excludes self-employed mothers

Table 3.4 (continued) - Summary statistics for each estimation sample; explanatory variables

	(1) **Sample of all mothers**	(2) **Sample of the working mothers**	(3) **Sample of the employed mothers**
Observations	42,231	22,556	18,246
Explanatory variables	Percent (%)	Percent (%)	Percent (%)
Wave			
2002	33.88	31.10	30.92
2005	31.94	32.29	31.76
2012	34.18	36.61	37.31

NOTES: Sample 3 excludes self-employed mothers

Table 3.5 - Probit model; marginal effects of labour force participation (1: employed; 0: not employed), sample=mothers with a two-year-old child

Explanatory variables	Marginal Effects	(Standard Errors)
foreignm	-0.243***	(0.013)
Region[1]		
northwest	0.232***	(0.006)
northeast	0.209***	(0.006)
centre	0.158***	(0.006)
islands	0.015*	(0.008)
Age[2]		
25-29	0.113***	(0.007)
30-34	0.166***	(0.007)
35-39	0.196***	(0.008)
Over 40	0.194***	(0.010)
Education[3]		
secondary school	0.151***	(0.005)
high education	0.322***	(0.007)
Household composition		
other adults	-0.022***	(0.005)
younger children[4]	-0.172***	(0.011)
older children[4]	-0.097***	(0.005)
Partner's employment status[5]		
self-empl partner	0.022**	(0.011)
blue-collar partner	0.020*	(0.011)
white-collar partner	0.046***	(0.011)
manager partner	0.023*	(0.013)
Financial situation		
house owner	0.047***	(0.005)
family transfer	-0.079***	(0.006)
Housework and childcare help		
partner h_work	0.123***	(0.007)
parents h_work	0.071***	(0.009)
cleaner h_work	0.189***	(0.009)
other h_work	0.079***	(0.017)
help index	0.050***	(0.002)
Wave[6]		
2005	0.010*	(0.005)
2012	0.022***	(0.006)
Observations	42,231	

*** p<0.01, ** p<0.05, * p<0.1

NOTES: The dependent variable equals 0 if the mother is either unemployed or inactive, 1 if works as employee or self-employed. Omitted categories: 1- Region: South; 2- Age: under 25; 3- Education: Low education; 4- Household composition: only child in the household; 5- Partner's employment status: not employed; 6- year: 2002.

Table 3.6 - Multinomial logit model; Relative Risk Ratios (RRR) of occupation; sample = employed mothers with a two-year-old child.

	Self-Employed	Blue Collar	Manager
Explanatory variables	(RRR)	(RRR)	(RRR)
foreign born	1.094	5.318***	0.514*
	(0.188)	(0.817)	(0.186)
Region[1]			
north-west	1.006	0.647***	0.934
	(0.067)	(0.048)	(0.086)
north-east	0.998	0.840**	0.914
	(0.067)	(0.060)	(0.085)
centre	1.074	0.995	0.897
	(0.068)	(0.070)	(0.080)
islands	0.706***	0.539***	0.945
	(0.063)	(0.060)	(0.120)
Age[2]			
25-29	0.904	0.626***	1.280
	(0.085)	(0.050)	(0.434)
30-34	1.030	0.483***	2.254**
	(0.095)	(0.039)	(0.741)
35-39	1.127	0.400***	3.698***
	(0.111)	(0.036)	(1.222)
over40	1.153	0.333***	4.996***
	(0.132)	(0.038)	(1.672)
Education[3]			
secondary school	0.278***	0.099***	1.976**
	(0.019)	(0.005)	(0.616)
high education	0.442***	0.015***	14.700***
	(0.034)	(0.002)	(4.531)
Household composition			
other adults	1.105*	1.226***	0.886
	(0.062)	(0.061)	(0.119)
younger children[4]	1.339**	0.831	1.341*
	(0.155)	(0.126)	(0.220)
older children[4]	0.979	0.989	0.902
	(0.047)	(0.049)	(0.059)
Partner's employment status[5]			
selfemp partner	1.617***	0.638***	0.893
	(0.191)	(0.076)	(0.167)
bluecollarpartn	0.546***	1.368***	0.506***
	(0.067)	(0.158)	(0.105)
whitecollarpartn	0.468***	0.423***	0.575***
	(0.057)	(0.050)	(0.107)
managerpartn	0.883	0.343***	1.934***
	(0.120)	(0.059)	(0.367)

Table 3.6 (continued) - Multinomial logit model; Relative Risk Ratios (RRR) of occupation; sample = employed mothers with a two-year-old child.

	Self-Employed	Blue Collar	Manager
Explanatory variables	(RRR)	(RRR)	(RRR)
Financial situation			
houseowner	0.990	0.858***	1.019
	(0.052)	(0.046)	(0.079)
familytransf	0.955	1.187***	0.924
	(0.061)	(0.076)	(0.086)
Parental leave			
paidmatleave	0.023***	0.888**	0.906
	(0.003)	(0.054)	(0.069)
matduration	0.735***	1.015*	0.985
	(0.018)	(0.008)	(0.010)
patduration	1.383***	0.922	1.136**
	(0.062)	(0.063)	(0.072)
PANEL A			
Childcare availability[6]			
selfcare	6.923***	1.234	1.025
	(0.978)	(0.227)	(0.383)
partnercare	0.943	1.541***	0.685**
	(0.103)	(0.139)	(0.127)
babyscare	1.231**	0.708***	1.494***
	(0.103)	(0.079)	(0.135)
pubnursery	0.937	0.730***	1.092
	(0.068)	(0.055)	(0.096)
pvtnursery	1.010	0.695***	0.926
	(0.064)	(0.050)	(0.081)
othercare	1.039	1.125	1.034
	(0.121)	(0.126)	(0.167)
PANEL B			
Childcare expenditure	0.993	0.936***	1.034***
	(0.007)	(0.007)	(0.010)
Observations	22,556	22,556	22,556

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Base Category: White-collar. Omitted categories: 1- Region: South; 2- Age: under 25; 3- Education: Low education; 4- Household composition: only child in the household; 5- Partner's employment status: not employed; 6- Childcare arrangement: grandparents. Other control variables included: year.

PANEL B indicates the result of model (3.2) estimated replacing the controls for childcare availability with childcare expenditure.

Table 3.7 - Dependent variable: weekly working hours; sample = employed mothers with a two-year-old child.

Specification	PANEL A		PANEL B	
Explanatory variables	marginal effects	(standard errors)	marginal effects	(standard errors)
Household composition				
otheradults	0.334**	(0.170)	0.337**	(0.169)
youngerchildren[1]	0.660	(0.432)	0.561	(0.432)
olderchildren[1]	-0.866***	(0.154)	-0.934***	(0.153)
Childcare availability[2]				
Selfcare	-0.859	(0.555)	-	-
Partnercare	-0.913***	(0.267)	-	-
Babyscare	0.186	(0.233)	-	-
Pubnursery	0.827***	(0.194)	-	-
Pvtnursery	1.108***	(0.204)	-	-
Othercare	0.473	(0.334)	-	-
Childcare expenditure	-	-	0.173***	(0.021)
Other control variables[3]	included		included	
Observations	11,354		11,354	

*** p<0.01, ** p<0.05, * p<0.1.

NOTES: Sample selection correction based on the first stage Probit model given by equation 3.1. Omitted categories: 1- Household composition: only child in the household; 2- Childcare: grandparents. 3- Other explanatory variables included in the model: Age, Region of residence, Education, Partner's employment status, Financial situation, Parental leave, Year.

PANEL B indicates the result of model (3.3) estimated replacing the controls for childcare availability with childcare expenditure.

Table 3.8 – The determinants of job attributes (selected results for childcare); Sample = mothers working as employees.

Dependent variable	Part-time employment				Private sector employment				Temporary-contract employment			
Specification	PANEL A		PANEL B		PANEL A		PANEL B		PANEL A		PANEL B	
	marginal effects	(standard errors)	marginal effects	(standard errors)	marginal effects	(standard errors)	marginal effects	(standard errors)	marginal effects	(standard errors)	marginal effects	(standard errors)
Household composition												
otheradults	-0.026***	(0.008)	-0.026***	(0.008)	-0.002	(0.010)	-0.001	(0.009)	0.005	(0.005)	0.006	(0.007)
youngerchildren[1]	-0.065***	(0.020)	-0.059***	(0.021)	-0.026	(0.022)	-0.029	(0.022)	-0.033**	(0.014)	-0.041**	(0.018)
olderchildren[1]	0.045***	(0.008)	0.050***	(0.008)	-0.070***	(0.009)	-0.071***	(0.009)	0.013**	(0.006)	0.019**	(0.008)
Childcare availability[2]												
selfcare	0.018	(0.030)	-	-	0.005	(0.035)	-	-	-0.016	(0.022)	-	-
partnercare	0.043***	(0.014)	-	-	-0.069***	(0.015)	-	-	0.020**	(0.010)	-	-
babyscare	-0.036***	(0.013)	-	-	-0.031**	(0.013)	-	-	-0.019**	(0.009)	-	-
pubnursery	-0.028***	(0.010)	-	-	-0.019*	(0.010)	-	-	-0.001	(0.007)	-	-
pvtnursery	-0.031***	(0.009)	-	-	0.010	(0.010)	-	-	-0.007	(0.007)	-	-
othercare	-0.011	(0.016)	-	-	-0.011	(0.018)	-	-	0.027**	(0.011)	-	-
Childcare expenditure	-	-	-0.007***	(0.001)	-	-	0.001	(0.001)	-	-	-0.004***	(0.001)
Other control variables[3]	included		included		included		included		included		included	
Observations	18,246		18,246		18,246		18,246		18,246		18,246	

*** p<0.01, ** p<0.05, * p<0.1.

NOTES: Omitted categories: 1- Household composition: only one child in the household; 2- Childcare arrangement: grandparents. 3- Other explanatory variables included in the model: Age, Region of residence, Education, Partner's employment status, Financial situation, Parental leave, Year. All the models are estimated with a Probit model with sample selection equation (based on equation 3.1). The dependent variables for the 2nd stage models are the following: part-time employment (0: employed on a full-time contract; 1: employed on a part-time contract); private sector employment (0: employed in the public sector; 1: employed in the private sector), temporary contract employment (0: employed on permanent contract; 1: employed on a temporary contract). PANEL B indicates the result of models (3.4) – (3.6) estimated replacing the controls for childcare availability with childcare expenditure.

Appendix C

Table C. 1 - Multinomial probit model with sample selection equation; coefficients; 1st stage dependent variable (0: mother is either unemployed or inactive, 1: mother is self-employed or employed); 2nd stage dependent variable (1: self-employed; 2: blue-collar; 3: white-collar 4: manager); sample = working mothers with a two-year-old child.

	Blue-collar	White-collar	Manager
Explanatory variables	(Coefficients)	(Coefficients)	(Coefficients)
Household composition			
otheradults	0.0919**	-0.0623	-0.0998
	(0.0439)	(0.0432)	(0.0859)
youngerchildren[1]	-0.363***	-0.203**	0.101
	(0.121)	(0.0957)	(0.127)
olderchildren[1]	-0.0478	0.0128	-0.0103
	(0.0483)	(0.0413)	(0.0556)
Childcare[2]			
self-care	-1.338***	-1.537***	-1.396***
	(0.120)	(0.105)	(0.232)
partnercare	0.331***	0.00765	-0.147
	(0.0898)	(0.0833)	(0.127)
babyscare	-0.350***	-0.169***	0.118
	(0.0895)	(0.0652)	(0.0780)
pubnursery	-0.136**	0.0574	0.0610
	(0.0687)	(0.0564)	(0.0735)
pvtnursery	-0.270***	-0.0315	-0.115*
	(0.0626)	(0.0499)	(0.0686)
othercare	0.0712	-0.0256	0.0191
	(0.100)	(0.0905)	(0.126)
Other control variables[3]	included	included	included
Observations	42,443	42,443	42,443

*** p<0.01, ** p<0.05, * p<0.1

NOTES: Omitted category in 2nd stage: self-employed. Omitted categories of the explanatory variable1- Household composition: only one child in the household; 2- Childcare arrangement: grandparents. 3- Other explanatory variables included in the model: Age, Region of residence, Education, Partner's employment status, Financial situation, Parental leave, Year.

Table C. 2 - Multinomial probit model; coefficients; dependent variable (1: self-employed; 2: blue-collar; 3: white-collar 4: manager); sample = working mothers with a two-year-old child.

Explanatory	Self-employed	Blue collar	White collar	Manager
Explanatory variables	(margins)	(margins)	(margins)	(margins)
Household composition				
otheradults	0.004	0.019***	-0.018**	-0.006
	(0.005)	(0.005)	(0.008)	(0.006)
youngerchildren[1]	0.030***	-0.020	-0.023	0.012
	(0.011)	(0.013)	(0.017)	(0.008)
olderchildren[1]	0.001	-0.001	0.005	-0.005
	(0.005)	(0.005)	(0.006)	(0.003)
PANEL A				
Childcare availability[2]				
selfcare	0.194***	-0.022	-0.157***	-0.016
	(0.012)	(0.015)	(0.024)	(0.017)
partnercare	-0.009	0.043***	-0.019	-0.015*
	(0.011)	(0.009)	(0.014)	(0.009)
babyscare	0.023***	-0.032***	-0.012	0.021***
	(0.008)	(0.010)	(0.012)	(0.005)
pubnursery	-0.002	-0.027***	0.025***	0.004
	(0.007)	(0.007)	(0.009)	(0.004)
pvtnursery	0.012*	-0.034***	0.027***	-0.004
	(0.006)	(0.007)	(0.009)	(0.004)
othercare	0.000	0.011	-0.013	0.002
	(0.011)	(0.010)	(0.015)	(0.008)
PANEL B				
Childcare exp.	0.001	-0.006***	0.004***	0.002***
	(0.001)	(0.001)	(0.001)	(0.000)
Other control variables[3]	included	included	included	included
Observations	22,556	22,556	22,556	22,556

*** p<0.01, ** p<0.05, * p<0.1

NOTES: Omitted category in the dependent variable: self-employed. Omitted categories of the explanatory variables: 1- Household composition: only one child in the household; 2- Childcare arrangement: grandparents. 3- Other explanatory variables included in the model: Age, Region of residence, Education, Partner's employment status, Financial situation, Parental leave, Year. PANEL B indicates the result of model (3.2) estimated replacing the controls for childcare availability with childcare expenditure.

CHAPTER 4: FEMALE SELF-EMPLOYMENT: LABOUR SUPPLY AND SATISFACTION WITH HOURS OF WORK

4.1 Introduction

The International Social Survey Programme (1989) – a study that surveyed individuals from 11 different OECD countries about their desired employment status – revealed that a large share of individuals would like to be self-employed. Among these countries, Italy had the highest proportion of individuals indicating a preference for self-employment. In fact, 61% of wage-employed individuals declared that they would rather be self-employed, whereas from the entire population 65% of respondents stated that they would prefer to be self-employed if they could choose between wage employment and self-employment. Self-employment is a desirable option because – among other reasons – it represents an opportunity for individuals to set their own schedule and choose which hours to work (Blanchflower 2000). In this respect, self-employment is particularly appealing for women as it may help them to reconcile their career with domestic responsibilities given that they are still doing the bulk of the household chores (Wellington, 2006; see also Chapter 3, Section 3.1).

From the point of view of policy-makers, self-employment is also acknowledged to play an important role in job creation and economic prosperity which has prompted various governments over the last few decades to implement policies to promote self-employment (OECD, 2015; Blanchflower, 2000). Furthermore, economists have been evaluating government policies that increase the attractiveness of female self-employment (e.g. reducing the costs of health insurance) as an alternative to family policies aimed at balancing the demands of family and employment for women (Wellington, 2006).

Given the acknowledged importance of female self-employment and the fact that women on, an average, relative to men, take more responsibility for domestic work, a

large number of empirical studies have investigated whether the determinants of self-employment differ by gender, focusing on the role of household composition. It has been shown that the presence of dependent children in the household and marital status affect (positively) a female's probability of being self-employed but have little impact on men (Parker, 2009). Since men tend to contribute less to household production, family members can represent a constraint on the time that women can dedicate to the labour market. Consequently, females may select into self-employment due to the possibility of having control over their working hours which makes it possible for them to combine a family and a career. In addition, some studies have used macro-level data to show that the likelihood of choosing self-employment over wage employment for women is higher in countries such as Italy, Greece and Spain, where the availability of childcare is relatively low (Thébaud, 2011; Noseleit, 2014). However, there is a lack of research investigating whether household composition affects the time that self-employed women dedicate to their job due to a shortage of data on the hours worked by the self-employed. This is an important issue as working hours represent a measure of entrepreneurial performance, indicating the effort that is needed as a productive input to help ventures survive and grow (Parker, 2009).

Since women may find it more difficult to combine family and career due to tighter time constraints relative to men, a natural question that arises is whether female workers are satisfied with their working hours, and whether they are more satisfied than men when working as self-employed (compared to employees). This is an interesting question as job satisfaction has been linked to worker productivity and well-being (Clark, 1997).

In this chapter, we use data from the Italian Labour Force Survey (LFS) to investigate the determinants of female self-employment. A large number of studies have focused on the extensive margins of labour supply, defined as the probability of being

self-employed compared to being wage-employed. We also analyse the determinants of different types of self-employment (specifically, being an entrepreneur, own-account professional freelance, professional freelance with employees, small-business owner, small-business owner with employees, or a family worker). In line with previous studies, we stress the role of household structure as an important factor influencing the labour supply of women. Secondly, we examine the determinants of hours supplied by self-employed women (i.e. the intensive margins of labour supply) and the determinants of satisfaction with respect to their work hours, which have not attracted a great deal of attention due to data shortage (Parker, 2009).

Italy provides a different context for analysis compared to previous studies that have mainly focused on Anglo-Saxon and North-European countries. In fact, Italy is characterised by the presence of a sizable self-employment sector, which accounts for 24% of jobs in the economy and it is the country with the second highest rate of self-employment in Europe after Greece (OECD, 2018a). Secondly, Italy as well as other European Mediterranean countries is characterised by a lack of family-friendly public policies (e.g. universal childcare) and a traditional division of household labour, which makes a woman's reconciliation between work and family responsibilities particularly difficult. In addition, compared to other OECD countries, Italian households are usually more extended and family members tend to maintain strong ties (see Chapter 2)[58].

To analyse labour supply at the extensive margin, two econometric models are estimated. First, we estimate a probit model of employment versus self-employment, in line with the existing literature[59]. Second, we estimate a multinomial logit model which compares the probability of being observed in one of the self-employment categories

[58] As explained in Section 2.1 of Chapter 2, the Italian LFS uses a definition of household which reflects this characteristic of Italian families. In particular, family is defined as 'all persons related by marriage, kinship, affinity, adoption, guardianship, cohabiting and having their usual residence in the same municipality' (Istat, 2011).

[59] All the models are estimated for all individuals in the sample, and also separately for females and males to capture differences by gender.

relative to being an employee. Self-employment has been usually treated as a single category even though it is a very heterogeneous group, which includes a wide array of professions ranging from lawyers to farmers (Parker, 2009). Such professions differ with respect to factors such as required skills, time constraints, start-up capital, exposure to uncertainty, and managerial abilities (in Appendix E we explain in more detail how different self-employment categories in Italy reflect these characteristics). Such information is rarely available from labour market surveys at this level of detail. We investigate whether the determinants of self-employment vary across self-employment categories, with a focus on gender differences[60]. In particular, we estimate the above models based on the following samples: 1,701,361 employed and self-employed individuals (including both women and men), 724,219 females and 977,142 males.

To investigate the intensive margin of labour supply, we estimate an ordinary least squares (OLS) model using usual hours of work as the dependent variable. We analyse a dataset containing information on hours worked for 390,947 self-employed workers in Italy, and compare the results with those obtained from the sample of 1,309,784 employees. The analysed sample covers the period 2009-2017. From a methodological point of view, the use of OLS may be subject to a potential selection bias that may arise when focusing on specific subsamples of individuals. For example, employees, unemployed and inactive individuals are excluded when estimating the determinants of hours worked by the self-employed. To tackle this problem, we estimate a two-step selection model with the method proposed by Lee (1983) to take into account the potential sample selection. Specifically, we estimate an OLS model of hours worked for the subsample of self-employed and include a correction term to account for the probability

[60] There are a small number of studies which have focused on specific categories of self-employment (such as farmers, taxi-drivers, physicians) but there is a lack of studies comparing the different categories of self-employment.

of being observed in the self-employment sample relative to the probability of being inactive, unemployed or wage-employed.

To investigate the determinants of satisfaction with respect to hours worked, we use OLS and ordered logit regressions, in line with the previous studies focusing on hours and job satisfaction. We compare the results across samples (self-employed females versus self-employed males, and self-employed females versus female employees) to shed some light on preferences over working hours of self-employed females.

Our findings show little evidence of gender differences at the extensive margins of labour supply but different results emerge at the intensive margins of labour supply. In particular, the main differences were related to the relationship between hours worked and household composition. Controls for family members were inversely associated with the hours worked by self-employed women but positively related to the hours supplied by self-employed men. We argue that this is consistent with the hypothesis of a traditional division of household work in Italian families. Our findings also reveal that, among self-employed women, having children was positively related to satisfaction with hours. Mothers working as employees were more satisfied with hours than those without children when they worked less than 30 weekly hours, but less satisfied than those without children when they worked more than 30 weekly hours. Since social norms such as the unbalanced division of household labour affect mostly the careers of females, in the absence of family policies, self-employment appears to represent a potential solution that allows them to combine work and domestic responsibilities.

4.2 Background Literature

4.2.1 The Determinants of Female Self-Employment

There is an extensive literature focusing on the determinants of self-employment, highlighting the role of access to capital, the transfer of knowledge from parents,

macroeconomics factors, and institutional factors (for extensive reviews of this literature, see among others Blanchflower, 2000; Georgellis and Wall, 2005; Parker, 2009).

A strand of the literature has found that men and women select into self-employment for different reasons (e.g. Carr, 1996, Boden, 1999; Allen and Curington, 2014). In particular, men regard self-employment as an opportunity for greater earnings while women choose self-employment as a time-flexible option that allows them to combine family and work commitments. Allen and Curington (2014) used data from the Wisconsin Entrepreneurial Climate Study 1992–1993 to investigate the reasons behind the self-employment choice for 252 males and 267 females living in the US. They estimated a multinomial logit model with three employment categories (wage-employment, self-employment, and non-participation in the labour force) separately for men and women, and controlled for demographic characteristics (age, education, ethnicity, marital status and the number of children). Their model also included proxies for individual preferences over job attributes (earnings, recognition, the possibility of being autonomous, and willingness to commute) and for the individual's perception of the 'entrepreneurial climate'. In particular, the entrepreneurial-climate variables captured the perceived support from the government and banks for firm creation in the local market and other non-pecuniary factors such as the way people felt about the possibility of a business failure, or whether entrepreneurship was seen as a form of success.

They found that a woman's probability of being self-employed was influenced positively by family-related variables such as the presence of a spouse and the number of children in the household, while the opposite relationship was found for men. The association between the probability of being self-employed and the preference for "creating wealth for their own families" was positive for women but negative for men. In contrast, the probability of being self-employed for men was higher among those who saw self-employment as an opportunity for greater (personal) earnings, and this effect

was larger than for women. Agreement that bankers and the government helped new firms get started in the respondent's area were positively related to a man's probability of being observed in self-employment, but unrelated to the employment status of women. Hence, they concluded that a man's choice to be self-employed is driven by pecuniary factors (i.e. the opportunity of greater earnings), whereas women selected into self-employment because of family reasons such as the possibility to balance family and work commitments[61]. Similar results were found by Boden (1999) and Arai (2000) who used data from the US and Canada, respectively.

Since household production plays an important role in a female's choice of employment, studies focusing on the determinants of female self-employment have stressed the role of household composition. Parker (2009) has surveyed a number of studies that found a positive correlation between marriage and female self-employment (see e.g. Longstreth et al., 1987; Boden, 1999; Bond and Sales, 2001). He concluded that, even if a link between marital status and self-employment participation exists for both men and women, there are at least two gender-specific reasons why marriage (or cohabitation) affects a woman's probability to be an entrepreneur. First, since men tend to contribute less to household production, even when the cohabiting woman is employed and irrespective of whether men are self-employed or wage-employed, women choose self-employment because its flexibility allows them to combine career and family commitments. Second, since evidence shows that women are more likely to end up in low-profit self-employment sectors, a male partner may represent financial support and make it feasible for the woman to stay in such occupations.

[61] The 'flexibility hypothesis' according to which women choose self-employment to balance work and family has been tested by Lombard (2001), using data from the Current Population Survey for the period 1979-1990. Lombard (2001) measured the demand for flexibility as the difference in weekly work hours between the year of the interview and a reference point a year before. She found that a woman was more likely to choose self-employment (over wage-employment) the greater her demand for flexibility.

The link between the number of children and female self-employment has been documented by Parker (2009). When formal childcare is provided at an expensive price, self-employment is chosen by women because it provides the flexibility that allows them to combine self-provided childcare with work. This is consistent with the empirical evidence of studies that have shown that the number of children has a stronger (positive) impact on female self-employment participation compared to men. For example, Carr (1996) estimated a logit model of self-employment versus wage-employment based on a sample of 55,502 individuals from the US Census of Population and Housing. She found that women with children aged 0-6 were more likely to be self-employed, while having young children was negatively associated with self-employment for men.

Boden (1999) used the same method but a different dataset, a sample of 47,081 individuals from the 1995 US Current Population Survey, and found that women with young children were more likely to be self-employed while there was no such effect for men. Connelly (1992b) analysed how women combined childcare with work, based on a sample of 8,155 American mothers from the 1984 Panel of the Survey of Income and Program Participation (SIPP). She estimated a multinomial logistic regression model and used the following combinations of childcare and employment status as categories of the dependent variable: non-participants; employee and childcare provider (that is, whether the individual was both employed and also the main provider of childcare for their child); employee and non-childcare provider; self-employed and childcare provider; self-employed and non-childcare provider. She found a positive effect of the number of children aged 0-2 on the probability of being in the 'self-employed and childcare provider' category, while no effect was found on the probability of being an 'employee and childcare provider', and on the probability of being 'self-employed and non-childcare provider'. These results are also consistent with the findings obtained in other studies

based on data from the US (see e.g. Caputo and Dolinsky, 1998; Wellington, 2006) and Sweden (Vejsiu, 2011).

In a cross country analysis, Noseleit (2014) investigated the impact of childcare availability on the share of self-employed females in the workforce and on the performance of self-employed females, measured as the percentage of self-employed females with employees. He used data from the European Social Survey (ESS), containing information for 30 OECD countries from 2002 to 2010. Noseleit (2014) estimated two regression models with the following dependent variables: (1) the share of self-employed women in the workforce (self-employed and employees) calculated for each country; and (2) the share of self-employed women with employees in the workforce. They controlled for the following set of explanatory variables: the female unemployment rate; the proportion of individuals living with a partner in the household; the share of the service sector in the country; the female labour force participation (LFP) rate; the share of households with children younger than four; the share of 0-3 year-old children enrolled in childcare; and an interaction term between formal childcare enrolment and the presence of young children.

The results of this study showed that rates of female self-employment and female self-employment with employees were driven by different factors. For example, an increase in GDP was positively related to the proportion of self-employed females in a country but unrelated to the number of self-employed females with employees. Higher shares of households with young children and childcare enrolment were positively associated with the proportion of self-employed women but negatively related to the share of self-employed women with employees. The marginal effect associated with the interaction term between childcare enrolment and the share of households with 0-4 year-old children revealed an interesting result. In countries with a relatively high number of families with children, higher rates of childcare enrolment were inversely associated with

female self-employment. This is consistent with the hypothesis that women with children may be incentivised to choose occupations that allow them to combine childcare and paid work, by providing options for childcare.

Finally, Rosti and Chelli (2005) examined whether there is a link between gender discrimination and selection into self-employment. They analysed the transition of Italian women into and out of self-employment over two periods, from 1978 to 1989 and from 1997 to 1998, using administrative data provided by Istat. During the two periods of analysis, the number of women in wage-employment increased constantly whereas the number of self-employed women remained stable. According to the predictions of the economic theory of discrimination, women may be pulled into self-employment as a consequence of gender discrimination in wage-employment. In particular, discriminatory behaviours exerted by employers could result in lower wages for females, and this would lower the opportunity cost for women of starting-up a new business.

To test whether Italian females were pulled into self-employment by gender discrimination, Rosti and Chelli (2005) conducted Markovian analysis of transition matrices. They estimated the probability of entering/exiting self-employment for males and females observed over time in four potential employment statuses - inactivity, unemployment, wage-employment, and self-employment - and the average time spent in each state. They found that, relative to men, women were more likely to enter self-employment from a state of inactivity or unemployment, and less likely to go from wage-employment to self-employment. In addition, individuals who had gone from wage-employment to self-employment had a higher probability of surviving in self-employment for longer periods, suggesting that the skills learned in salaried jobs were fundamental to survival in self-employment.

They concluded that there were two different pathways into self-employment for males and females. Men entered self-employment to continue (more profitably) an

activity already performed in the salary sector or as an alternative in the case where they lost their salaried job. In contrast, women were more likely to become self-employed because discrimination excluded them from wage-employment. This would alter the distribution of entrepreneurial talent between men and women because gender discrimination would push less experienced or less talented women to enter self-employment. However, since less experienced entrepreneurs had a lower probability of surviving, this may explain why the rate of female self-employment was constant over the period analysed. One potential limitation of this study relates to its omission of individual characteristics such as age, household structure, education, ethnicity, and occupational characteristics that have also been found to affect the selection into self-employment of females.

To conclude, there is a wide literature that has investigated the determinants of female self-employment, focusing on the role of household production. Most of these studies were based on US and UK data. A few exceptions include Arai (2000), Georgellis and Wall (2005), Craig et al (2012), Noseleit (2014), who have used data from Canada, Germany, Australia, and Sweden, respectively. Rosti and Chelli (2005) was the only attempt to investigate gender differences in the determinants of self-employment using Italian data, but their study did not take into account the role of individual and occupational characteristics, which have been found to play an important role in explaining female self-employment in other countries. Additionally, most of the current studies have considered self-employment as a homogeneous group despite the fact that types of self-employment may differ in many areas such as required competences, control over working hours, managerial abilities, and start-up capital.

In this study, we investigate the determinants of female self-employment in Italy focusing on the role of household composition. This has not attracted much attention in the literature despite the fact that Italy represents an interesting context for the analysis,

and differs from the majority of the existing studies that have focused on Anglo-Saxon countries. We also explore whether determinants of female self-employment differ across the following self-employment categories: entrepreneurs, small business owner, freelance professionals (both with and without employees), and family workers.

4.2.2 The Determinants of Hours Worked by Self-Employed Females

A large number of studies have investigated the labour supply of employees, showing that the determinants of hours worked differ between men and women (see Blundell and MaCurdy, 1999, for a review). A strand of this literature has investigated the determinants of hours worked by females, focusing on the role of household production (e.g. Blundell et al., 1987; Euwals and van Soest, 1999; Klevmarken, 2005)[62].

In contrast, there is a lack of research exploring the determinants of hours worked by self-employed individuals, due to a shortage of data (see Parker, 2009). The small number of studies in this area have mainly focused on the estimation of the elasticity of work hours with respect to the wage, based on samples of self-employed men (Wales, 1973; Rees and Shah, 1994; Ajayi-obe and Parker, 2005; Thornton, 1998; Parker et al., 2005). For example, Ajayi-obe and Parker (2005) used longitudinal data from the BPHS to investigate the determinants of working hours among 1,964 self-employed men living in the UK during the period 1991 to 2000. They used OLS to estimate a model of weekly work hours (expressed in natural logarithm) and compared the results with those obtained based on a sample of 9,060 employees. Their set of explanatory variables contained the following: wage (measured as the natural log of weekly labour income divided by weekly work hours), non-labour income, marital status, the partner's hours of work, the number of own children in the household, a dummy variable indicating whether the individual was disabled, if the individual was caring for other individuals in the household, a dummy

[62] The literature on female labour supply is very large but focuses almost entirely on employees (for a survey of this literature, see Killingsworth and Heckman, 1986). Here, we summarise the literature on the number of hours worked by the self-employed, which is the main focus of the chapter.

variable indicating whether the individual was classified as own-account worker or employer (only for the self-employed), and a dummy variable to account for whether the individual had other jobs. The problem of estimating the effect of wages on hours worked for the self-employed is that wages are often imputed from profits and hours, and therefore potentially subject to endogeneity (Parker, 2009). To tackle this problem, Ajayi-obe and Parker (2005) adopted a two-stage least square (2SLS) approach in which the wage was instrumented with the following set of explanatory variables: age, age squared, education, and the length of current employment spell. They compared the results from OLS with the 2SLS approach, but the estimates were qualitatively unchanged.

They found that men responded to higher wages by working less hours and this reduction was slightly more pronounced for employees (with an elasticity of 0.04, compared to 0.06 for self-employed individuals). For both the self-employed and employees, non-labour income was related to a 2 percentage point (pp) decrease in work hours. Among self-employed individuals, employers worked 6pp more hours than own-account workers. Having a second job was related to an increase in the number of hours worked by employees but unrelated to the labour supply of self-employed men. For both the self-employed and employees, the number of hours worked was unrelated to the partner's hours of work, the number of children, caring for others and having a disability. Being married was unrelated to the labour supply of the self-employed but associated with an increase in the hours worked by employees.

Finally, Ajayi-obe and Parker (2005) compared summary statistics on hours worked, job satisfaction, and satisfaction with work hours between the self-employed and employees. They showed that self-employed men worked longer hours than employees and reported lower satisfaction with their work hours. In addition, overall job satisfaction was higher for employees. They interpreted these figures as the self-employed enjoying other nonpecuniary factors (such as the desire for independence) more than employees.

Hence, this would push them to work longer hours even though they are less satisfied with respect to the amount of hours worked. However, this argument was based on a simple comparison of average scores (sample means), rather than being supported by analysis of the determinants of job and hours' satisfaction. Booth and van Ours (2008) analysed the link between hours worked and work hours satisfaction, and showed that working longer hours was not associated with a lower level of job satisfaction (see Section 4.2.3, for a detailed discussion). In addition, a potential issue with the IV approach used by Ajayi-obe and Parker (2005) is related to the use of instruments such as age, education and job tenure. These variables have been found in previous studies to be associated with hours worked (e.g. Feinberg, 1987; Colombino and del Boca, 1990). Hence, this may violate the required condition for a valid instrument to be uncorrelated with the error term of the model of interest (see Wooldridge, 2002).

Feinberg (1987) used data from the University of Michigan's Panel Study of Income Dynamics to investigate the determinants of working hours of 68 self-employed individuals, all observed in both 1970 and 1971. He classified owner-managers (the self-employed) as those individuals who reported working for themselves, and compared them with hired-managers, who stated that they worked for someone else. To calculate the effect of wages on the labour supply of self-employed individuals, Feinberg (1987) adopted an alternative approach to 2SLS. He used a predicted wage imputed from the sample of hired-managers and interpreted this as the 'shadow wage', the wage that owner-managers could earn if they worked in paid employment[63]. A model of annual hours worked was estimated by means of Seemingly Unrelated Regression (SUR), and included the following set of explanatory variables: age, ethnicity, gender, education, sector of

[63] This methodology consists of a two-step model. In the first step, a wage equation was estimated by regressing annual wages (in natural logarithm) on personal characteristics, educational attainment, and industry. In the second step, the regression coefficients estimated for hired-managers were used to compute the shadow wage for self-employed managers. The same approach was also used by Rees and Shah (1994) focusing on a sample of 98 self-employed males from the US.

occupation, a dummy variable accounting for whether the individual was living in a large city rather than in a rural area, and the predicted wage[64].

The results showed that the number of hours worked were positively related to wages (with an elasticity of 0.23) and age, with an increase of 9.3 hours per year. Self-employed females worked 261 hours less than self-employed males per year, and non-white individuals worked 830 hours more per year than their white counterparts. Finally, the number of hours worked was found to differ across sectors, with individuals in agriculture working the least number of hours per year. However, the methodology used by Feinberg (1987) to impute a predicted wage based on hired-managers may be subject to a potential limitation. If owner-managers have different characteristics from hired-managers, this measured shadow wage may not represent a good measure of what the self-employed could earn in wage-employment. For example, Rosti and Chelli (2005) found that Italian women who entered self-employment in the 1990s were more likely to have less work experience compared to those in wage-employment (see Section 4.2.1)[65]. Another potential limitation of this study concerns the possibility of drawing valid conclusions based on estimates that were obtained on a very small sample.

To conclude, there is a large literature that has investigated the labour supply of employees, but limited attention has been paid to self-employed workers. The available research on self-employment has focused on the estimation of work hours elasticities with respect to wages, based on samples of men (see Parker, 2009, for a comprehensive review). In addition, some of these studies have focused on specific categories of self-employment such as farmers, doctors, and taxi drivers (Lopez, 1984; Camerer et al., 1997; Thornton; 1998). Feinberg (1987) examined the labour supply of 68 self-employed

[64] The SUR approach was used to take into account cross-equation error correlations (expected from using data for the same individuals across two consecutive years). In fact, Feinberg (1987) did not exploit the longitudinal nature of the data but used the SUR approach as an alternative to estimate separate OLS regressions for each year.

[65] In fact, managerial roles are usually associated with higher work experience (see Chapter 3, Section 3.4.2).

workers, including men and women. However, he did not investigate whether the determinants of hours worked differed by gender and this was probably due to small sample sizes.

In the current chapter, we investigate the determinants of hours worked by Italian females, with a particular focus on the role of household structure. This is important for a country like Italy, where families tend to be more extended than in other countries and women are constrained by domestic responsibilities, due to a traditional division of household production (see Chapter 3). We also account for different categories of self-employment, due to the availability of a large dataset that contains detailed information on type of self-employment (such as professional freelance, small businesses, family businesses, or entrepreneur). We argue that the number of hours worked may vary across types of self-employment reflecting such unobserved characteristics such as different entry required skills and time-constraints (see Section 4.2.1).

4.2.3 The Determinants of Satisfaction With Respect to Working Hours

There are only a limited number of studies that have investigated the determinants of satisfaction with respect to working hours regardless of employment type. Clark (1997) investigated the determinants of job satisfaction and satisfaction with respect to working hours, based on a sample of employees from the British Household Panel Survey (BHPS). He noticed that British women reported higher levels of job satisfaction than men, and higher satisfaction with respect to all aspects of their job, including hours of work[66]. He proposed four potential explanations for why self-reported measures of job satisfaction differed by gender: (i) because men and women had different characteristics and jobs; (ii) because men and women valued job attributes - such as number of hours, pay, and career opportunities - differently; (iii) because job satisfaction might reflect different job

[66] Individuals from the BHPS were asked to report on a 1-7 scale the degree of satisfaction with respect to the following aspects of their job: hours of work, pay, prospects of promotion, relations with their supervisors, job security, ability to work on their own initiative, and overall job satisfaction.

expectations between men and women; (iv) because sample selection might play a role, if the probability of being employed is correlated with potential job satisfaction. Clark (1997) estimated ordered probit models with overall job satisfaction and satisfaction with respect to working hours as dependent variables. The explanatory variables included gender, age, marital status, region of residence, education, health status, income, and job characteristics (working hours, firm size, industry, occupation). He estimated the determinants of (overall) job satisfaction separately for men and women but the determinants of hours satisfaction only for the sample including both men and women. Clark also ran a specification of the above model of overall job satisfaction with the inclusion of a set of dummy variables that captured the two job attributes which were valued by respondents as the most important aspects of their job[67]. This was included to test for whether men and women had preferences over different job characteristics (hypothesis (ii)). The idea behind this exercise was to assess changes in the coefficient associated with the control for gender, after accounting for how individuals value job attributes.

Clark performed a similar exercise to assess whether differences in job satisfaction by gender were due to their different job expectations (hypothesis (iii)). Specifically, he included two additional variables - predicted income and the mother's labour force status - that were assumed to be correlated with job expectations. Finally, Clark (1997) tried to account for the potential sample selection (hypothesis (iv)) and estimated a two-step Heckman model with a probit model of employment versus non-employment in the first-stage, and an OLS model for the job satisfaction equation[68].

[67] In particular, respondents were asked to indicate the two most important aspects of their jobs among the following: hours of work, pay, prospects of promotion, relations with their supervisors, job security, ability to work on their own initiative, and overall job satisfaction.

[68] The following set of variables was used to identify the model: spouse's pay, spouse's hours of work, own unearned income, income of other household members, the number of children in the household, and a set of variables capturing the household division of domestic tasks.

The results of this study showed that hours satisfaction was negatively associated with being male, age, income, education, hours worked, and having a temporary contract. On the other hand, there was a positive link between satisfaction with work hours and health, and with promotion opportunities. The determinants of job satisfaction differed by gender. For example, renting, being married, hours of work, union membership and managerial status were significantly related to the job satisfaction of women but unrelated to men's job satisfaction. Valuing hours worked and the relationship with the supervisors as the most important factors were associated with larger increases in job satisfaction for employed women, while employed men gave more importance to pay and career opportunities. Regarding hypothesis (ii), the controls for how individuals valued job attributes accounted for a modest portion of the gender gap in job satisfaction. In fact, the coefficient associated with 'gender' changed from 0.26 to 0.23 units after including work values in the regression model. Regarding hypotheses (iii) and (iv), including controls for job expectations had a larger impact on gender - reducing the gender coefficient from 0.26 to 0.17 units - whereas accounting for sample selection did not affect the results for men and women. Hence, Clark concluded that job expectations were the most important factor in explaining the gender differences in job satisfaction, while job values played a minor role. Although Clark (1997) recognized that women valued working hours more than men, he did not investigate whether the determinants of satisfaction with hours differed by gender. In addition, this study omitted the role of the self-employed.

Focusing on a sample of 3,856 cohabiting couples from the BHPS, Booth and van Ours (2008) investigated the link between working hours, satisfaction with respect of hours worked, and overall job satisfaction. They estimated ordered logit models of hours and job satisfaction separately for men and women, and included controls for age, nationality, the number of children, region of residence, educational attainment, health status, income, own and partner's working hours, type of contract, and firm size. To

control for working hours, they included a set of dummy variables denoting the following categories: small part-time jobs (1-15 hours), large part-time jobs (16-29 hours), regular full-time jobs (30-39 hours), or full-time and working overtime (40 plus hours)[69]. First, they estimated ordered logit models for hours and job satisfaction using pooled cross-sections. Second, they accounted for potential unobserved factors using the fixed effects ordered logit estimator proposed by Ferrer-i-Carbonell and Frijters (2004), and they obtained similar results to the first method. In particular, they found that having children was unrelated to job and hours satisfaction for both men and women, whereas the effect of working hours on the two measures of satisfaction differed by gender. For women, working full-time was associated with a decrease in hours and job satisfaction in line with the hypothesis that women are happier working part-time because they can combine work with family and house responsibilities. For men, satisfaction with respect to hours was the lowest when working 40 plus hours but no difference was found between working part-time and working with a regular full-time job (up to 40 hours). Job satisfaction was found to be unrelated to hours of work for men. They also found little evidence of cross-partner effects. For men, satisfaction with hours increased when partners worked between 16 and 39 hours, while job satisfaction was unrelated to the hours of work of the partner. For women, both satisfaction with hours and job were unrelated to the hours worked by their partners.

Booth and van Ours (2007) used the same methodology to investigate the determinants of satisfaction with job and hours for 2,326 Australian couples from the Household, Income and Labour Dynamics (HILDA) Survey, and found similar results as in Booth and van Ours (2008). In their studies, Booth and van Ours (2007; 2008) considered workers as a single category with no distinction between the self-employed

[69] However, for men the categories 1-15 hours and 16-29 hours were collapsed into one single part-time variable, due to a low concentration of men in small part-time jobs.

and employees. However, existing studies show that the self-employed and employees differ in terms of hours worked, preferences over being able to choose their working hours, and satisfaction with respect to the hours worked (see Blanchflower, 2000; Booth and van Ours, 2007; Booth and van Ours, 2008) [70].

In the present chapter, we examine the determinants of satisfaction with hours based on a sample of self-employed individuals from the Italian LFS[71]. We also explore whether the determinants of satisfaction with hours differ by gender as there is evidence that men and women have different preferences for hours worked and control over working hours. From a methodological point of view, studies in the area of job satisfaction and hours satisfaction have employed either OLS or ordered probit models (see e.g. Clark, 1997; Blanchflower, 2000; Lange, 2012). We adopt both approaches and compare the results, as explained in Section 4.4.

4.3 Data

The data set used for this chapter is drawn from the Italian Labour Force Survey (LFS), a cross-sectional study that has provided information on the Italian labour market since 2009[72]. This is an ongoing survey in which 280,000 randomly selected households are surveyed each quarter of the year about employment status and household composition. This dataset is ideal for this study because it contains detailed information on different aspects of the respondent's occupation (type of occupation, number of hours worked, sector of employment, satisfaction with respect to working hours, and business size) and household composition.

[70] This seems to be the case for Italy, given that these differences are apparent in the Italian LFS.
[71] Most of the studies in the literature have focused on overall job satisfaction rather than satisfaction with hours (see, e.g., Blanchflower, 2000; Sousa-Poza and Sousa-Poza, 2003), while Clark (1997) and Booth and van Ours, (2008) estimated models for both hours and job satisfaction. We investigate the determinants of hours satisfaction as the focus of this chapter is on working hours.
[72] The characteristics of this dataset are described in detail in Section 2.3 of Chapter 2. The Istat provides a short longitudinal version of the data which contains information on individuals observed over two periods. However, this could not be used in the present study as the longitudinal does not include key variables, such as household structure and hours satisfaction.

With respect to employment status, individuals are classified into one of the following employment categories: inactive, jobseekers, employee, pseudo-employee, and self-employed[73]. In addition, employees are classified into the following sub-categories: white-collar, blue-collar, apprentice, or homeworker; and self-employed are classified as: entrepreneurs, professional freelance, a small-business owner, working in a relative's firm, or a member of a cooperative. The number of working hours reported by respondents refers to the usual amount of weekly hours.

The above information is available for individuals interviewed in the period from the first quarter of 2009 to the second quarter of 2017[74]. We use this information to estimate econometric models based on a variety of samples. Models of the determinants of self-employment (and types of self-employment) are estimated based on 1,701,361 individuals that reported to be either employed or self-employed. Models of the determinants of hours worked are estimated for 390,947 self-employed individuals and for 1,308,460 waged workers, separately. In addition, since the focus of our analysis is on gender differences, all models are estimated for males and females separately (all summary statistics for the dependent variables and the number of observations used are reported in Table 4.3).

The LFS contains a question which provides information on satisfaction with hours, namely "*how satisfied are you with the number of hours worked? Indicate a score from 0 to 10, where 0 indicates 'not at all satisfied' and 10 'completely satisfied'*". Information on satisfaction with respect to the hours worked is only available from 2013. This is used to estimate a model of the determinants of satisfaction with hours based on samples of 188,741 self-employed individuals and 643,996 employees interviewed in the period 2013 to 2017.

[73] An accurate definition of self-employment according to the Italian civil code is provided in Appendix E of this chapter. In Section 3.3.2 of Chapter 3, we also provide a definition of pseudo-employee (p.112).
[74] This analysis refers to the period after the financial crisis of 2008.

Table 4.1 reports the number of observations that are excluded from the analysis due to a variety of reasons. Since the interest of this chapter is on self-employed individuals, we only include individuals of working age (16-65 years), thus we exclude from the analysis 1,984,421 individuals of non-working age; we further exclude 1,512,524 individuals that are either inactive or unemployed, and 25,991 pseudo-employees. In addition, 3,230 individuals working as members of cooperatives are excluded because they account for a very small number of observations, and 26,495 individuals with more than one job are omitted due to problems of controlling for job-specific characteristics such as employment sector and job tenure for multiple job holders. Finally, 24,083 observations are not included in the analysis due to missing values relating to hours worked and education, as well as 25,515 missing observations relating to hours satisfaction. In order to provide an overview of the analysis, in Table 4.1.A we present a summary of the samples analysed in this chapter.

4.4 Method

The first model estimated in this chapter investigates the individual's probability of being self-employed relative to being an employee, and it is estimated as follows:

$$\Pr(empl\_status_i = j|x_i) = x_{1i}'\beta + \varepsilon_i \quad (4.1)$$

where $empl\_status$ is a binary variable that takes the value of 1 if the individual is self-employed (compared to 0 if the individual is an employee); x_1 includes controls for individual characteristics in line with the existing literature (gender, age, nationality, the highest level of education attained, region, employment sector, job tenure, household composition, time quarter), these are described in more detail in Section 4.4.1; β denotes the related vector of parameter estimates; and ε is the error term. Equation (4.1) is estimated by a probit model. This is estimated based on the sample of 1,701,361

individuals - with the inclusion of a dummy variable for gender - and separately for 724,219 females and 977,142 males, which will capture gender differences in the determinants of self-employment.

The second model investigates the determinants of the probability of being in different categories of self-employment and it is estimated as follows:

$$\Pr(occupation_i = k|x_i) = x_{1i}'\beta + \varepsilon_i \quad (4.2)$$

where *occupation* is a categorical variable, where *k=8*, and this includes employees (as the base category) and seven types of self-employment (entrepreneur, own-account professional freelance, professional freelance with employees, small-business owner, small-business owner with employees, and family worker); x_1 is the set of explanatory variables described in Section 4.4.1 below; β denotes the vector of parameter estimates; and ε is the error term. Equation (4.2) is estimated as a multinomial logit model. Similar to equation (4.1), this model is estimated individually for all 1,701,361 individuals in the sample, and then with separate regressions for 724,219 females and 977,142 males. The summary statistics for the types of self-employment by gender are shown in Table 4.3 and discussed in Section 4.4.1 below.

In both models (1) and (2), we use time quarters to control for time-varying factors because the employment status of individuals is observed in a particular period of the year. Cyclical factors (e.g. availability of seasonal jobs) may affect the probability of being in a particular employment status.

To investigate labour supply at its intensive margin, the following model is estimated:

$$hours_i = x_{2i}'\beta + w_i'\delta + u_i \quad (4.3)$$

where *hours* denotes the usual number of hours worked on a weekly basis (in logs); x_2 includes controls for individual characteristics described in Section 4.4.1 (gender, age, nationality, region, job tenure, household composition, year) and in line with the existing literature; *w* denotes a set of controls to proxy for the individual's wage (highest level of education attained, job tenure, employment sector, occupation); β and δ denote the related vectors of the parameter estimates; and u is the error term. Equation (4.3) includes controls for year. Model (4.3) is estimated with OLS for both subsamples of 1,308,460 employees and 390,947 self-employed. Since the focus of our analysis is to capture differences between women and men, we also estimate separate regressions for the following subsamples: 118,614 self-employed women, 272,333 self-employed men, 605,001 female employees, and 703,459 male employees.

For each of the above subsamples, we also estimate a two-step model with the method proposed by Lee (1983) to account for the potential sample selection that may arise from excluding the other categories from the analysis. For example, when we estimate an OLS model of hours worked for the self-employed we include the correction term to account for the probability of being observed as self-employed, compared to being either an employee or non-employed. These correction terms are computed from a first-stage multinomial logit model where the dependant variable goes from 0 to 2 - corresponding to the following employment statuses: non-employed, wage-employed, or self-employed[75]. The summary statistics of the number of hours worked (expressed in natural logarithm) for each sample are shown in Table 4.4. On average, self-employed

[75] The necessary condition to estimate this model is to have at least one variable in the first-stage model that determines selection, that is, an explanatory variable that is correlated with the probability of being self-employed (or an employee) but unrelated to the number of hours worked by the individuals. However, the choice of such over-identifying variable is difficult (Ham, 1982; Wooldridge, 2002). For this reason, we use the 'regional unemployment rate' following the previous study by Ham (1982) which focuses on the hours worked by employees, and report the results in Tables (D.1) - (D.2) in Appendix D as a robustness check.

individuals tend to work longer hours (3.71) than employees (3.56) and men tend to work more hours than women, in both subsamples of self-employed and employees[76].

To investigate the determinants of satisfaction with respect to hours worked, the following model is estimated:

$$hours\ satisfaction_i = x_{2i}'\beta + w_i'\delta + h_i'\gamma + u_i \quad (4.4)$$

where *hours satisfaction* denotes the self-reported index of satisfaction with respect to the hours worked; *x* includes controls for the individual characteristics described in Section 4.4.1 (gender, age, nationality, region, job tenure, household composition, and year); *w* denotes a set of controls for wage proxies (highest level of education attained, job tenure, employment sector, occupation); *h* includes a set of dummy variables capturing the number of hours worked and interaction terms between hours worked and the number of children (see Section 4.4.1); β, δ, and γ denote the related vectors of the parameter estimates; and ε is the error term. In the Italian LFS, individuals were asked to report their level of satisfaction with respect to hours on a scale from 0 (complete dissatisfaction) to 10 (complete satisfaction). Studies focusing on self-reported measures of satisfaction have usually employed either OLS or ordered multinomial response models (e.g. Clark, 1997). However, Carbonell and Frijters (2004) compared these two methodologies and found little difference between them. To estimate equation (4.3), we adopt both empirical strategies. We compare the OLS results with those obtained from ordered logit models which we run as a robustness check (see Tables D.3 - D.5 in Appendix D), but we found similar results between the two methods. The models of the determinants of satisfaction with hours are estimated for the subsamples of 188,741 self-employed and 643,996

[76] Self-employed individuals worked on average 43.6 weekly hours, compared to 35.2 weekly hours worked by employees.

employees. In addition, to capture differences between women and men the models are estimated for the following subsamples: 59,317 self-employed women, 129,424 self-employed men, 340,032 female employees, and 303,964 male employees. The summary statistics relating to the satisfaction with hours worked for each of the samples considered in our analysis are presented in Table 4.4. Compared to employees, self-employed individuals were less satisfied with respect to their working hours. In fact, the level of self-reported satisfaction was 6.64 for self-employed and 7.26 for employees. Among the self-employed, women were more satisfied than men (with their levels of satisfaction being 6.75 and 6.59, respectively) whereas female employees were less satisfied than male employees (with the respective levels of satisfaction being 7.23 and 7.28).

4.4.1 Explanatory Variables

Table 4.2 gives a description of all explanatory variables used in the analysis. The choice of explanatory variables included in our models is based on the existing literature. For example, all the dependent variables included in our models (equations 4.1-4.4) are related to personal characteristics such as gender, age, age squared, nationality, and educational level (Clark, 1997; Caputo and Dolinsky, 1998; Boden, 1999; Arai 2000; Blanchflower, 2000; Georgellis and Wall, 2005; Wellington, 2006; Vejsiu, 2011). Hence, we include a dummy variable to control for gender for the models estimated on the entire sample of individuals and controls for age and age squared.

To control for the highest level of education attained, we use a set of four dummy variables. The variable 'low education' (the reference category) captures individuals with no formal education, primary education (usually attained at the age of 10) or a junior high school certification (usually between ages 11 and 14); this category is equivalent to the Key Stage 3 level of the UK system. The variable 'vocational education' comprises people who attained either a vocational diploma (3 years after junior high school) and it is comparable to the Key Stage 4 of the UK system. The variable 'secondary school'

refers to people who attained a high school diploma (usually attained at the age of 19), comparable to the Key Stage 5 of the UK system. The dummy variable 'high education' comprises individuals with a university degree (Bachelor, Masters or PhD). An additional dummy variable ('other training') is included to control for the attainment of other vocational qualifications offered by non-conventional educational institutes. Specifically, in Italy it is possible to take training courses that are officially recognised by the regional authorities and are used to acquire specific skills in various employment sectors. These courses are provided by recognized non-conventional educational institutions (i.e. they are different from primary school, junior school, high school and universities) and target individuals with different levels of education. Examples of areas of these courses are cooking, hairdressing, marketing and computer programming[77].

In line with Brown and Sessions (1999), we include a set of five dummy variables to account for regional differences, following the official division into macro-areas used by Eurostat. The 'North-West' includes the regions of Piemonte, Lombardia, Valle d'Aosta and Liguria. The 'North-East' comprises the regions of Trentino Alto Adige, Veneto, Friuli Venezia Giulia, and Emilia Romagna. The 'Centre' includes the regions of Toscana, Umbria, Marche, Lazio, Abruzzo and Molise. The 'South' comprises the regions of Campania, Basilicata, Puglia, and Calabria. Finally, the 'Islands' refers to Sicilia and Sardegna.

The likelihood of being self-employed and the number of hours worked by an individual have been found to be related to family income and the partner's earnings (see e.g. Blau and Robins, 1991; Kimmel and Connelly, 2007). Since information on income is not available in the LFS, we use the partner's occupation as a proxy for household income and the partner's earnings, in accordance with Chiuri (2000). In particular, 4 dummy variables are used to capture the employment status of the partner (compared to

[77] Source: Citta' di Torino webpage (http://www.comune.torino.it/)

not having partner as the reference category): inactive, unemployed, employee, self-employed. These variables are included as controls in all empirical models (equations 4.1-4.4) as family income has also been found to influence satisfaction with hours (Booth and van Ours, 2008). Previous studies have also shown that the labour supply of self-employed workers is affected by both the presence of a partner and the number of dependent children in the household (Parker, 2009). Hence, we use the variable 'own children' to capture the number of children aged between 0 and 16 years old in the household.

Empirical models of labour supply and hours satisfaction usually include controls for sector and type of occupation (see amongst others Clark, 1997; Blundell, and MaCurdy, 1999; Bond and Sales, 2001 Ajayi-obe and Parker, 2005). To control for the sector of employment, we used the following set of ten categories based on the classification in sectors proposed by Istat: 'agriculture' (including agriculture, forestry and fishing), 'industry', 'construction', 'commerce', 'hotels (including hotels and restaurants), 'transportation' (comprising transportation and storage), 'information and communication' services, 'finance' (including financial and insurance activities), 'real estate' activities, 'other services' (including business services and other entrepreneurial activities), 'public administration and social services' (the reference category). The reference group was created by merging the following three categories from the LFS: 'public administration, defence, and social insurance'; 'education, health and other social services'; and 'other public and personal services'.

To control for the type of occupation, we used two different sets of dummy variables for self-employed and wage-employed individuals. For the models analysing the labour supply of employees, we used the following set of variables: blue-collar workers, this is the reference category; white-collar workers; and managers. In addition, the dummy variable 'temporary' was used to control for working on a temporary basis.

For the analysis of labour supply and hours satisfaction based on self-employed individuals, we controlled for the following professions: entrepreneurs, own-account professional freelance (used as the reference category being the largest group), professional freelance with employees, small-business owner, small-business owner with employees, and a family worker.

In models (1) and (2), we include a set of 36 dummy variables to control for the quarter of the interview running from the first quarter of 2009 ('2009q1', the reference category) to the second quarter of 2017 ('2017q2'). As explained in Section 4.4, the employment status of individuals is observed in a particular period of the year and cyclical factors (e.g. availability of seasonal jobs) may affect the probability of being in a particular employment status. In model (3), we employ a set of 9 dummy variables to control for the year of the interview, and use '2009' as the reference category.

In model (4), the model of the determinants of hours satisfaction, we control for the number hours worked by individuals in order to follow Booth and van Ours (2008). In particular, we include dummy variables corresponding to the following categories: 0 to 15 hours (the reference category), 16 to 30 hours, 31 to 45 hours, and over 46 hours. In this model, we also include an interaction term between the controls for hours worked and the number of dependent children in the household. Previous studies focusing on the determinants of satisfaction with respect to the hours worked have included the number of children as explanatory variable, see Booth and van Ours (2008). We argue that the number of children potentially has also an indirect impact on satisfaction with hours worked due to the fact that children alter the individual's allocation of time between market and non-market activities.

4.5 Summary Statistics

The summary statistics for the explanatory variables are given in Table 4.3 (categorical variables) and Table 4.4 (continuous variables). These are reported for the entire sample

of 1,701,361 individuals, and separately for the sub-samples of 391,577 self-employed and 1,309,784 employees. For each of these sub-samples, the figures are also split by gender.

The sample of the self-employed (employees) is made up of 30.3% (46.2%) of women and 69.7% (53.8%) of men. Self-employed women are, on average, younger (age 45) than their male counterparts (age 46.1), but, on average, they are older than men (43.2 versus 42.7) in the sample of employees. The percentage of individuals with foreign citizenship is higher in the subsample of employees. Among the self-employed (employees), 1.8% (4.3%) of women have EU citizenship and 2.8% (6.5%) of women have citizenship from a country outside the EU. In the subsamples of self-employed (wage-employed) men, the proportions of individuals with a non-Italian EU citizenship and individuals with a with a non-EU citizenship are 1.2% (2.8%) and 3.9% (7.6%), respectively.

There is a relatively high percentage of individuals with 'low education' levels and individuals with a university degree amongst the self-employed and a lower proportion of individuals with high school and vocational qualifications in the subsample of employees. In addition, females are more qualified than their male counterparts in the samples of self-employed and employees. Among self-employed (wage-employed) women, 34.5% (27%) have a low level of education, 7.7% (8.5%) have attained a vocational qualification, 34.5% (44.4%) have completed a high school diploma and 25.1% (22.6%) have completed a university degree. Among self-employed (wage-employed) men 42.7% (40.2%) have a low level of education, 7.1% (8.9%) have attained a vocational qualification, 34.9% (38.6%) have attained a high school diploma and 16% (13.3%) have completed a university degree.

Regarding the regional distribution of the samples, there is a higher concentration of self-employed individuals in the South and Central Italy, whereas employees are more

concentrated in the northern regions. The proportion of self-employed (wage-employed) women is 29.28% (30.52%) in the North-West, 21.71% (25.52%) in the North-East, 20.12% (18.93%) in Central Italy, 19.96% (16.37%) in the South and 8.92% (8.66%) on the Islands.

Regarding household composition, the proportion of single individuals is higher among employees (compared to the self-employed) and among females (compared to males). Men are also more likely to have an inactive partner and more children. Among self-employed (wage-employed) females, 30.7% (37%) are single, 9.8% (9.5%) cohabit with a non-active partner, 1.7% (2.3%) cohabit with an unemployed partner, 22.7% (39%) cohabit with a partner working as an employee, and 35.2% (12.1%) have a self-employed partner living in the household. In the subsample of self-employed (wage-employed) males, 28.6% (33.4%) are single, 28% (25.9%) cohabit with an inactive partner, 2.3% (3.4%) cohabit with an unemployed partner, 26.5% (33.6%) cohabit with a wage-employed partner, and 14.6% (3.8) have a self-employed partner living in the household. Self-employed (wage-employed) men have 0.85 (0.83) dependent children, while the number of children for self-employed (wage-employed) women is 0.81 (0.77)[78].

Table 4.4 shows that self-employed females have remained in the same job for 10.7 years, as compared to 11.5 years for self-employed males. This is in line with Rosti and Chelli (2005) who showed that the duration of self-employment in Italy is lower for females. In the sample of employees, women and men, on average, have remained in the same job for a similar period of time, that is, 10.4 years and 10.5 years, respectively. The distribution of the self-employed (employees) across occupational sectors is the following: 9.4% (2.7%) work in agriculture; 10.4% (23.1%) in industry; 12.7% (6.1%) in the construction sector; 25.1% (11.1%) in commerce; 7.9% (5.1%) in hotels and

[78] The percentage of individuals with at least one child in the household is: 34.21% (33.16%) in the sample of female self-employed (employees), and 35.42% (35.75%) in the sample of male self-employed (employees).

restaurants; 2.4% (5.19%) in transport; 1.6% (1.93%) in the 'information and communication' sector; 1.9% (2.9%) in finance; 17.2% (7.5%) in real estate; 4.9% (18.73%) in education and health; and 6.6% (6.9%) in the other services sector. In addition, 8.6% of employees work in public administration. In both samples of self-employed and employees, there is a higher proportion of women in sectors such as 'hotels', 'real estates', 'education and health', and 'other public services', compared to men. The proportion of men is higher in 'industry', 'construction' and 'transports'.

As explained in Section 4.4, the model of satisfaction with hours also includes dummy variables to control for the number of hours work by individuals. Women work fewer hours than their male counterparts, whereas a large percentage of self-employed individuals work longer hours (45plus), compared to employees. Among self-employed females (males), 6.91% (2%) work between 0 and 15 weekly hours, 21.5% (7.7%) work between 16 and 30 weekly hours, 43.5% (46.6%) work between 31 and 45 weekly hours, and 28% (43.5%) work more than 45 weekly hours. In the sample of female (male) employees, 5.5% (1%) work between 0 and 15 weekly hours, 35.8% (7.8%) work between 16 and 30 weekly hours, 55.8% (83.9%) work between 31 and 45 weekly hours, and 2.8% (7.16%) work more than 45 weekly hours.

4.6 Results

In this section, we present the results for models (4.1) to (4.6), described in Section 4.4. Although the existing literature has shown that causal relationships exist between household composition and the labour market outcomes analysed (see e.g. Parker, 2009), it is important to acknowledge that all of the results presented in this chapter represent associations rather than causal relationships.

4.6.1 The Determinants of Self-Employment

In this section, we report the results relating to the probability of being observed in self-employment compared to working as an employee for 1,701,361 individuals in the

sample, and for the subsamples of 724,219 females and 977,142 males. We also analyse the determinants of the probability of being observed in one of the self-employment categories (entrepreneur, professional freelance - with or without employees -, small businesses - with or without employees -, and family worker) relative to being an employee, based on the same samples.

4.6.1.1 The Determinants of Female Self-Employment

Table 4.5 shows the average marginal effects relating to the probability of being self-employed for all individuals (column 1) and for the subsamples of females and males (columns 2 and 3).

We start the discussion focusing on the results based on the sample of all individuals. Among all individuals in the sample, the results relating to personal characteristics are in line with the existing literature (e.g. Boden, 1999; Brown and Session, 1999; Vejsiu, 2011). Being female is associated with a 10pp decrease in the probability of being self-employed relative to being an employee. Age is related to an increase in the probability of being self-employed relative to being an employee of 0.3pp, but at a decreasing rate. Having either European or non-European foreign citizenship is associated with a decrease in the probability of being self-employed (relative to being an employee) by approximately 8pp.

In the sample of all individuals, the probability of being self-employed relative to being an employee is 1.2pp lower in the North-East and on the Islands (column 1), compared to living in the South. Living in the Centre is associated with a decrease in the probability of being self-employed relative to being an employee by 0.6pp whereas no difference is found between the South and the North-West.

Among all the individuals in the sample, having attained a vocational education (high school diploma) is negatively related to being self-employed compared to being an employee, with an increase in the probability of being self-employed by 1.7pp (1pp),

respectively. In line with Brown and Sessions (1999), university education is positively related to self-employment. Individuals who attained a university degree are, on average, 7pp more likely to be self-employed relative to working as employees. Finally, individuals who received other vocational training outside public school are, on average, 1.6pp more likely to be self-employed.

Compared to individuals who do not have a cohabiting partner, those with either an inactive partner or unemployed partner are 2.5pp and 4.9pp less likely to be self-employed, respectively. Having a partner working as an employee is associated with a reduction in the probability of being self-employed of 5.4pp, whereas individuals are 14.5pp more likely to be self-employed if the partner is self-employed. These results are consistent with the literature on positive assortative mating in the labour market (see, e.g., Bredemeier and Juessen, 2013), which suggests that individuals find partners with similar jobs. The number of dependent children in the household is associated with a 1.6pp-increase in the likelihood of being self-employed compared to being an employee. This is in accordance with the hypothesis that self-employment is more compatible with childcare responsibilities.

Focusing on the results for the subsamples of males and females, (columns (2) and (3) of Table 4.5), we do not find large differences in the determinants of self-employment by gender. The main difference is related to the regional distribution of the self-employed by gender. For women, the probability of being self-employed relative to being an employee is 1.6pp lower in the North-West, 3.4pp lower in the North-East, and 0.4pp lower in Central Italy. For men, living in Central Italy is associated with an increase in the probability of being self-employed of 1.5pp, while living in the North-East and North-West are associated with increases in the likelihood of being self-employed by 0.7pp and 1.2pp, respectively. For both men and women, the probability of self-employment relative to being an employee is negatively related to living on the Islands.

Regarding household structure, the results are similar between men and women but we find that the composition of the household has a larger effect for men. Compared to women (men) who do not have a cohabiting partner, those with either an inactive partner or unemployed partner are, respectively, 1.3pp (2.9pp) and 2.9pp (6.3pp) less likely to be self-employed relative to the probability of being an employee. Having a partner working as an employee reduces the probability of being self-employed relative to working as an employee, with a decrease of 4.9pp (6.1pp) for women (men). In contrast, women (men) are 11.8pp (17.1pp) more likely to be self-employed if their partner is also self-employed. Additionally, there is a positive relationship between having children and the probability of being self-employed relative to being an employee, this is however smaller for women (0.9pp) compared to men (2pp).

To conclude, we have not found large differences in the determinants of self-employment between men and women. The main difference is related to the regional distribution of the self-employed by gender. Specifically, self-employed men tend to concentrate in the relatively more prosperous areas of the country such as the northern regions and Central Italy, while women are more likely to be self-employed in the least wealthy areas such as the South and the Islands. This may reflect the fact that in regions where the female unemployment rate is particularly high, the difficulty in access to wage jobs for women may push them into self-employment. Regarding household structure, our key variables of interest, the results are similar between men and women but we find that the composition of the household has a larger effect for men. This is in contrast with existing studies which have found that the presence of additional household members affects (positively) a female's probability of being self-employed but has little impact on men (Parker, 2009). In the next section, we try to shed more light on these results by exploring the heterogeneity across different categories of self-employment.

4.6.1.2 The Determinants of Different Types of Self-Employment

Table 4.6 reports the results for the determinants of the probability of being in different types of self-employment relative to being an employee, focusing on the sample of all individuals, including both males and females. Table 4.7 reports the results relating to the subsamples of females and males (in columns 1-6 and columns 7-12, respectively).

We discuss here the results relating to the sample of all individuals. It is apparent from Table 4.6 that being female is inversely related to the probability of being in self-employment categories such as entrepreneurship, freelance, and small business ownership (compared to be an employee). In addition, the decrease is particularly large for the categories of self-employment that involve the management of workers (such as entrepreneur, freelance with employees, and small business with employees)[79]. In contrast, there is a positive relationship between being female and the probability of working in a family business relative to being an employee. One explanation is that working with family members may be a working arrangement that provides the flexibility to combine work and household responsibilities, which in Italian households are more often carried out by women (as discussed in Chapter 3).

Among all individuals in the sample, age is positively associated with all self-employment categories except for 'family business' for which we find a negative relationship. In line with the results found in the previous section, having foreign European or non-European citizenship is associated with a decrease in the probability of being self-employed in each category relative to working as an employee.

The probability of being an entrepreneur (compared to being an employee) is inversely related to all regions except for the North-East, for which a statistically insignificant relationship is found. Living in the northern regions or in Central Italy is

[79] These categories are also found to be associated with larger increases in hours worked (see Table 4.8), as discussed below.

positively related to the probability of undertaking freelance activities with employees, running a small business with employees, or working in a family business. In contrast, the probability of running a small business (relative to working as an employee) is negatively related to all regions. Living on the Islands is negatively related to all the self-employment types, but the associations for freelancer with employees and small business with employees are statistically insignificant (Table 4.6).

Table 4.6 provides a more complete picture of the relationship between education and self-employment compared to the previous section. The probability of running a small business and the probability of being a family worker are negatively associated with all the traditional qualifications (vocational, high school, university). In contrast, having attained a high school diploma or a university degree is positively associated with the likelihood of being either an entrepreneur or a professional freelancer (compared to being an employee). In addition, having a vocational qualification is unrelated to the likelihood of being a freelancer with employees and the probability of being an entrepreneur (relative to being an employee).

In the sample of all individuals, the results regarding household composition are consistent with those in the previous section. Having a self-employed partner is positively related to all self-employment categories (relative to being an employee), whereas an inverse relationship is found between cohabiting with an employed partner and being self-employed. Having an inactive partner, an unemployed partner or a partner working as an employee are negatively related to the probability of being observed in any of the self-employment types, compared to the probability of being an employee. This is consistent with the literature on positive assortative mating in the labour market (see Section 4.6.1.1).

In line with what is found for the previous model, we have found that the results relating to the controls for age, nationality, education, and job tenure are similar between men and women (see Table 4.7).

The main gender differences in the determinants of the types of self-employment relate to the controls for region. In northern regions, the most prosperous regions of the country, women are less likely to work as entrepreneurs and small business owners but more likely to work in a family business or as professional freelancers with employees (relative to being an employee). In the same regions, men are more likely to own small businesses with employees, undertake freelance activities (either as own-account workers or hiring other employees) or work in a family business. Females living in the North-West are more likely to work as own-account freelancers compared to being employees, while an inverse relationship is found between living in the North-East and being an own-account professional freelance. In central regions, both males and females are more likely to undertake freelance activities, run small businesses with employees or work in family firms. In contrast, living in the Centre is inversely related to being an entrepreneur for both samples of males and females. Women living on the Islands are more likely to be entrepreneurs, run a business with employees (either as a freelancer or a small business owner), or work in a family business. Interestingly, they are also less likely to run a business on their own (either as a freelancers or a small business owner). A possible explanation of why women are more likely to be self-employed managers rather than an own-account self-employee in the South and the Islands may relate to the lack of childcare services and services for the care of elderly people in these regions. Given that women are usually responsible for the care of dependent household members, they may need the support of employees if they want to run a business as the time they can dedicate to the labour market is constrained by family responsibilities. For men, living on the Islands is negatively related to all the self-employed categories but the association with two of these

categories (freelancer with employees and small business with employees) is statistically insignificant.

We also find some gender differences in the results relating to household composition. In the subsample of females, having an inactive partner is inversely associated with the probability of entrepreneurship, freelance, small business with employees, and family work (relative to being an employee), whereas a positive relationship is found with own-account businesses. For males, 'inactive partner' is inversely related to being an own-account worker and working in a family firm but positively associated with running a small business with employees (compared to being an employee). In addition, no relationship is found between 'inactive partner' and entrepreneurship and being freelance with employees. Having an unemployed partner is associated with a lower probability of being in any of the self-employment occupations relative to being an employee. However, for females the relationship between having an 'unemployed partner' and the probability of running an own-account business relative to being an employee is statistically insignificant. In line with self-employment being more compatible with childcare responsibilities, we find that women with children are more likely to be observed in all the self-employed categories (compared to work as employees). For men, there is a negative relationship between having children and being a family worker relative to the probability of being an employee. This may indicate that men with families chose more traditional (or profitable) types of occupation, with them generally being the main bread winners in the household.

4.6.2 The Determinants of Hours Worked

The results of the OLS model relating to the determinants of hours worked are presented in Table 4.8. This model is estimated for the samples of 390,947 self-employed individuals and 1,308,460 employees, including both males and females (see columns 1 and 4 of Table 4.8). To capture gender differences, the models are also estimated for the

following subsamples: 118,614 self-employed women, 272,333 self-employed men (columns 2 and 3 of Table 4.8), 605,001 female employees, and 703,459 male employees (columns 5 and 6 of Table 4.8). Since the focus of our analysis is on specific subsamples of workers (namely self-employees and employees), we also estimate two-step models to account for the potential sample selection that may arise from excluding other subsamples of individuals, i.e. non-participants to the labour market and employees/self-employed (see Section 4.4 for a detailed explanation). The results for these sample selection models are presented in Appendix D as robustness checks (Table D.1 and Table D.2). The results are in line with those obtained from the main specification.

In Table 4.8, we present a selected set of results for the main variables of interest. In particular, we have omitted the results relating to age, nationality, region of residence, sector of employment and job tenure (see notes at the end of these tables). These results are in line with the existing literature and for brevity are not presented here.

We start the discussion of the results relating to the sample of all self-employed individuals (see column 1 of Table 4.8) and the sample of all employees (see column 4 of Table 4.8). In accordance with expectations and the existing literature, being female is associated with a 19pp decrease in hours worked among the self-employed and 18.2pp decrease among employees. The results relating to education are similar between employees and self-employed individuals (see columns 1 and 4 of Table 4.8, respectively). In both these samples, having a vocational qualification is associated with an increase in work hours by 1pp. Having a high school diploma is unrelated to the hours worked by the self-employed but positively related to the hours supplied by those working as employees, with an increase of 0.6pp. Self-employed individuals (employees) who have attained a university degree work 0.8pp (0.3pp) fewer hours than those with low education.

Among self-employed individuals (column 1, Table 4.8), self-employment categories that involve the management of employees (entrepreneur, freelance with employees, small business with employees) are associated with longer working hours. The number of hours worked by freelancers with employees is 15.1pp larger than those supplied by own-account freelancers (see column 1 of Table 4.8). Entrepreneurs, small business owners with employees, and own-account business holders work 16.4pp, 14.7pp, and 5.2pp more than own-account freelancers, respectively. Working in a family business is associated with a decrease in the labour supplied by 9.1pp. Among all employees (column 4, Table 4.8), the hours worked by managers and white-collar workers are 9.5pp and 5.5pp more than those supplied by the blue-collars. In addition, having a temporary job is associated with a reduction of 7.7pp in the hours supplied by employees. Since the focus of the present study is on self-employment, the results relating to employees are reported here without adding further discussion for the sake of brevity.

Regarding household composition, the results show some differences between the self-employed and employees. For self-employed individuals (see column 1 of Table 4.8), having either an inactive or an unemployed partner is associated with an increase in the hours supplied of 1.7pp and 1pp, respectively. Among self-employed workers, having either a self-employed partner or a partner working as employee is associated with an increase in the hours worked by 2pp and 1.8pp. Among employees (column 4 of Table 4.8), individuals with an unemployed partner work 2.9pp less hours than their single counterparts, whereas no difference is found in the hours worked between employees with an inactive partner and those who are single. The presence of a self-employed partner or a partner working as an employee is associated with a reduction in the hours supplied by employees of 5.1pp and 2.9pp, respectively. In addition, having children is associated with a 1.9pp-reduction in the hours worked for both self-employed individuals and employees (see columns 1 and 4 of Table 4.8, respectively).

The model of the determinants of the hours worked is estimated for the subsamples of males and females separately, which captures any differences by gender. In particular, the results in columns 2 and 3 of Table 4.8 refer to self-employed women and self-employed men, respectively, whereas the results in columns 5 and 6 of Table 4.8 refer to male employees and female employees. We find that education, a proxy for wages, is inversely related to the hours supplied by self-employed women but positively related to hours worked by self-employed men. In particular, having attained either a high school diploma or a university degree increases the hours worked by self-employed women by 3.2pp and 3pp, respectively, while the association between hours worked by self-employed females and having a vocational qualification is negative but statistically insignificant. Self-employed men with either vocational education or high school education work 1.7pp and 1.4pp more than those with no education, whereas there is a statistically insignificant association between university education and the labour supply of self-employed men. Interestingly, a positive relationship is also found between education and hours worked by female employees. Specifically, having a vocational qualification is associated with a 1.8pp increase in the hours supplied by women in wage-employment, while having attained a high school diploma or a university degree increases their hours of work by 2.4pp and 1.2pp, respectively. One explanation for why these results differ by gender may relate to the fact that an increase in wages associated with education has a substitution effect and an income effect. The former describes how individuals increase their hours of work to exploit the opportunity of higher earnings; the latter relates to the effect of having higher purchasing power on the choice between work and non-work activities (Parker, 2009). While the substitution effect is strictly positive, the income effect can be positive, when individuals work more hours to reach a target income, or negative, when the desired income has been reached and workers want to spend more time in non-labour activities rather than earning additional income. Hence,

an increase in the wage (associated with education) might have a negative effect for self-employed women if the income effect dominates the substitution effect, that is, if they substitute more hours from work to non-labour activities such as domestic work in response to a wage change. This is consistent with existing studies showing that women select self-employment for family reasons, whereas men choose self-employment mainly driven by the possibility of greater earnings (see Section 4.2).

As discussed above, individuals in self-employment categories that involve the management of employees work more hours than own-account self-employed individuals. In addition, the increases are larger for self-employed females (see columns 2 and 3, Table 4.8). The number of hours worked by women (men) in the category 'freelancer with employees' is 21pp (12.1pp) larger than those supplied by own-account freelancers (see column 2-3 of Table 4.8). Women (men) working as entrepreneurs, small business owners with employees, and own-account business holders work 18pp (15.1pp), 19.6pp (11.9pp), and 8pp (3.3pp) more than own-account freelancers, respectively. Working in a family business is associated with a decrease in the labour supplied by 9.1pp for women and by 3.8pp for men. Among female (male) employees (columns 4 and 5, Table 4.8), the hours worked by managers and white-collar workers are 9.3pp (1.9pp) and 11.2pp (8.3pp) more than those supplied by blue-collars workers. In addition, having a temporary job is associated with a reduction of 9.2pp (6.5pp) in the hours supplied by females (males).

In the samples of self-employed (see columns 2 and 3 of Table 4.8), the results relating to household composition differ substantially between men and women. For example, the presence of additional members in the household is associated with an increase in the hours worked by self-employed men and with a reduction in the hours worked by self-employed women. A similar pattern is found among employees (see columns 5 and 6 of Table 4.8).

Among self-employed women (column 2, Table 4.8), those who cohabit with an inactive partner work 2pp less hours than single women, while there is a statistically insignificant relationship between hours worked by self-employed women and the presence of an unemployed partner in the household. The presence of a self-employed partner or a partner working as an employee is associated with a reduction in hours supplied by self-employed women of 4pp and 3.1pp, respectively. In addition, having children is associated with a 7.1pp reduction in the hours worked by self-employed females. Among self-employed men (column 3, Table 4.8), having either an inactive or an unemployed partner is associated with an increase in the hours supplied of 3.5pp and 1.5pp, respectively. The presence of a self-employed partner or a partner working as an employee is associated with a reduction in hours supplied by self-employed men of 7.6pp and 4.3pp, respectively. Having children is unrelated to the hours supplied by self-employed men. These results are consistent with existing studies showing that self-employed men substitute fewer hours from work to family than self-employed women (Ajayi-obe and Parker, 2005).

To summarise the results from this section, we have found evidence of different determinants of hours worked between self-employed males and self-employed females. In particular, additional household members and higher education are associated with self-employed women working less hours, but positively related to the hours worked by self-employed men. These results are consistent with the hypothesis that women substitute more hours from work to family, being more involved in house responsibilities compared to men. In addition, we found that the number of hours worked is larger for self-employment types that are less likely to be held by females, such as entrepreneurs, professional freelancer and small business owners with employees.

To conclude, in Sections 4.6.1 and 4.6.2 we have analysed the extensive and intensive margins of the labour supply of self-employed individuals in Italy. Unlike

existing studies using data from countries such as the US, the UK, Canada, and Sweden, we have found that the determinants of self-employment are similar between women and men in Italy. However, gender differences were found at the intensive margins of labour supply for the self-employed, and we have argued that such differences may be attributed to different ways to balance work hours and family responsibilities. In the next section, we investigate the link between working hours and satisfaction with hours in order to examine whether preferences with respect to hours worked differ by gender, and whether differences are apparent across the samples of the self-employed and employees.

4.6.3 The Determinants of Satisfaction With Hours

The results of the OLS model relating to the determinants of satisfaction with respect to hours worked are reported in Table 4.9A. This model is estimated for the samples of 643,996 employees and 188,741 self-employed individuals, including both males and females (columns 1 and 4 of Table 4.9A). To capture gender differences, the model is also estimated for the following subsamples: 118,614 self-employed women (column 2 of Table 4.9A), 272,333 self-employed men (column 3), 605,001 female employees (column 5), and 703,459 male employees (column 6). In Table 4.9B we present specific results relating to the associations between hours worked and satisfaction with hours, comparing individuals with and without children. As explained in Section 4.4, we also estimate an ordered probit model of hours satisfaction as a robustness check, focusing on the same samples. The results - reported in Tables D.3, D.4 and D.5 in Appendix D - are consistent with those presented in this section.

We start the discussion of the results relating to the sample of all self-employed individuals (column 1 of Table 4.9A) and the sample of all employees (column 4 of Table 4.9A). Self-employed females are more satisfied with the hours worked compared to their male counterparts, with an increase of 0.05 standard deviations (SD), whereas women working as employees are 0.01 SD less satisfied with their work hours compared to male

employees. This result is different from Clark (1997) who found a positive relationship between being female and satisfaction with hours, but he focused on a sample of employees from the UK.

Individuals in self-employment categories that involve the management of employees are more satisfied with their working hours (entrepreneur, freelance with employees, or small business with employees) compared to own-account self-employed workers (see column 1 of Table 4.9A). In fact, being an entrepreneur and a professional freelancer with employees is associated with an increase in the satisfaction with hours of 0.18 SD and 0.08 SD, respectively, compared to being an own-account freelancer. Holding an own-account business is associated with a decrease in satisfaction with hours of 0.07 SD, whereas owning a small business with employees is related to an increase in the level of satisfaction with hours of 0.07 SD. Finally, self-employed individuals working in family businesses have a level of satisfaction that is 0.2 SD higher than for own-account freelancers. Among all employees (see column 4 of Table 4.9A), the level of satisfaction with hours of white-collar employees and managers is, respectively, 0.17 SD and 0.19 SD higher compared to blue-collar employees. In addition, workers employed with a temporary contract have a level of hours' satisfaction of 0.08 SD lower compared to those with a permanent job.

Regarding household composition, the results do not differ significantly between self-employed workers (column 1, Table 4.9A) and employees (column 4, Table 4.9A). In the sample of all self-employed workers (employees), having an inactive partner is related to an increase in satisfaction with hours of 0.04 SD (0.05 SD), whereas the presence of an unemployed partner is related to a decrease in satisfaction with hours of 0.11 SD (0.04 SD). The presence of a partner working as employee is associated with an increase in the satisfaction with hours of 0.07 SD (0.04 SD) for the self-employed

(employees), while having a self-employed partner is related to an increase in their satisfaction with hours by 0.06 SD (0.07 SD).

The model of the determinants of satisfaction with hours includes interaction terms between the presence of children in the household and number of hours worked. These allow for a potential indirect impact of dependent children on satisfaction with hours worked by individuals, given that children alter the individual's allocation of time between market and non-market activities (as explained in detail in Section 4.4). Hence, the results relating to hours of work are interpreted as the change in satisfaction with hours related to increases in hours worked for individuals without children. Specifically, we find a positive and non-linear relationship between hours worked and satisfaction with hours for individuals without children, in both samples of the self-employed and employees (see columns 1 and 4 of Table 4.9A, respectively). In the sample of self-employed workers (employees), working between 16 and 30 weekly hours is associated with an increase in their level of satisfaction with hours by 0.63 SD (0.83 SD), compared to those working between 1 and 15 hours per week. Working between 31 and 45 hours is related to the largest increase in the level of satisfaction with hours of self-employed individuals (employees) without children, being of 0.89 SD (1.01 SD). Working 46 plus hours is associated with an increase in satisfaction with hours of childless self-employed individuals (employees) by 0.64 SD (0.68 SD) relative to working between 1 and 15 hours per week.

In the sample of all self-employed individuals (employees), having a child is associated with an increase in satisfaction with hours of 0.086 SD (0.083 SD) for those who work between 1 and 15 weekly hours (columns 1 and 4 of Table 4.9A, respectively). Among all self-employed individuals (employees) with children, those who work between 16 and 30 hours have a standardized hours' satisfaction coefficient of 0.714 (0.952), reflecting an additional 0.08 SD (0.12 SD) increase in the satisfaction with hours

relative to those who work the same number of hours and have no children (columns 4 and 10 of Table 4.9B)[80]. Among all self-employed individuals (employees) with children, those who work between 31 and 45 hours have a standardized hours' satisfaction coefficient of 0.92 (1.08), with an additional 0.03 SD (0.01 SD) increase in the satisfaction with hours relative to those work the same number of hours and have no children. Among all self-employed individuals (employees) with children, those who work more than 46 hours have a hours' satisfaction coefficient of 0.66 (0.66), reflecting an increase (decrease) in satisfaction with hours of 0.02 SD (0.02 SD) relative to self-employed individuals (employees) who work the same number of hours and have no children.

Now we discuss the estimates for the above model based on the subsamples of males and females. In particular, the results in columns 2 and 3 of Table 4.9A refer to self-employed women and self-employed men, respectively, whereas the results in columns 5 and 6 of Table 4.9A refer to male employees and female employees. Focusing on the controls for self-employment categories, women (men) who work as entrepreneurs, professional freelancers with employees and small business owners with employees have a level of satisfaction, respectively, 0.26 SD (0.12 SD), 0.10 SD (0.05 SD), and 0.13 SD (0.04 SD) higher compared to those working as own-account freelancers. Owning a small business is related to a decrease in satisfaction with hours for men by 0.1 SD, whereas no difference is found in the level of satisfaction with hours between women who own a small business and those who work as professional freelancers without employees. Among self-employed females, a large increase in satisfaction with hours is also found to be associated with working in a family business (0.25 SD compared to 0.09 SD for self-employed men). The flexibility offered by this work arrangement may be preferred by

[80] These are computed by adding all the statistically significant coefficients. For example, self-employed individuals who work between 16 and 30 hours have a coefficient of 0.714, obtained as the sum of the following coefficients: the number of hours worked (0.628), having children (0.086), and the interaction term '16-30hours#children' (which is zero, at the 99% confidence level). For clarity, in Table 4.9B we present the results relating to the associations between hours worked and satisfaction with hours, comparing individuals with and without children.

women because it allows them to reconcile family and career. Among employees (see columns 5 and 6 of Table 4.9A), the results relating to the controls for the different occupations (blue-collar, white-collar and managers) are similar between men and women and are not discussed here for the sake of brevity.

Among self-employed workers (columns 2 and 3 of Table 4.9A), the results relating to household composition are similar between men and women. Having a partner in wage-employment is associated with an increase in satisfaction with hours of 0.07 SD (0.06 SD) for self-employed women (men), while the presence of a self-employed partner increased their satisfaction with hours by 0.05 SD (0.04 SD). For self-employed women (men), cohabiting with an unemployed partner is associated with a reduction in satisfaction with hours by 0.11 SD (0.11 SD). In contrast, the presence of an inactive partner is related to a 0.04 SD increase in a self-employed male's satisfaction with hours but unrelated to a self-employed female's satisfaction hours. Among employees (columns 5 and 6 of Table 4.9A), the presence of a working partner is positively associated with the satisfaction of hours worked by women but unrelated to men's satisfaction with hours. This result accords with Booth and van Ours (2008), who found that the satisfaction with hours of women is positively related to the hours worked by their male partners, whereas a man's satisfaction with hours is unrelated to the hours worked by their female partners. For women (men) working as employees (columns 5 and 6 of Table 4.9A), having an inactive partner is related to an increase in satisfaction with hours by 0.03 SD (0.03 SD), whereas a negative relationship is found between having an unemployed partner and the satisfaction with respect to the hours worked by both women (0.06 SD) and men (0.04 SD).

In the samples of self-employed workers (columns 2 and 3, Table 4.9A) and in the samples of employees (columns 5 and 6, Table 4.9A), we find a positive relationship between hours worked by individuals without children and the satisfaction with hours. In

addition, the increases in satisfaction with hours are larger for men compared to women for both self-employed and employees. Specifically, the increase in the level of satisfaction among self-employed women (men) without children is 0.55 SD (0.74 SD) higher for those who work between 16 and 30 weekly hours, 0.58 SD (1.2 SD) higher for those who work between 31 and 45 weekly hours, and 0.25 SD (0.98 SD) higher for those who work over 46 weekly hours. Among female (male) employees without children, working between 16 and 30 weekly hours is related to an increase in satisfaction with hours of 0.88 SD (0.65 SD) compared to those working from 1 to 15 weekly hours. Working either 31-45 weekly hours or over 46 weekly hours is associated with increases in the level of satisfaction with hours of female (male) employees without children by 1.01 SD (1.19 SD) and 0.61 SD (0.79 SD), respectively.

Focusing on individuals who work between 1-15 weekly hours, having children is related to a 0.11 SD (0.12 SD) increase in satisfaction with hours for female self-employed (employees), but related to a 0.13 SD (0.22 SD) decrease in satisfaction with hours for male self-employed (employees).

The results relating to the interaction terms show that, among self-employed women, having children is positively related to satisfaction with hours and the increase is particularly high for those who work between 16 and 30 weekly hours (column 5, Table 4.9B). Among self-employed women, those with children who work 16-30 (31-45) weekly hours have a hours' satisfaction coefficient of 0.67 (0.61), reflecting an additional 0.11 SD (0.2 SD) increase in the satisfaction with hours relative to those who work the same number of hours and have no children. Self-employed females who work 46+ weekly hours have a hours' satisfaction coefficient of 0.28, reflecting an additional 0.03 SD increase in the satisfaction with hours relative to those who work the same number of hours and have no children. In contrast, female employees with children are more satisfied with hours than those without children when they work less than 30 weekly hours, but

less satisfied than those without children when they work more than 30 weekly hours. Among female employees, those with a child who work 16-30 hours have an hours' satisfaction coefficient of 1.01, reflecting an additional 0.012 SD increase in the satisfaction with hours relative to those who work 16-30 weekly hours and have no children. Female employees with children who work 31-45 (46+) weekly hours have an hours' satisfaction coefficient of 0.99 (0.57), reflecting an erosion in the satisfaction with hours of 0.02 SD (0.04 SD) relative to those who the same weekly hours and have no children.

In the samples of self-employed men and men working as employees, having children is positively related to an increase in satisfaction with hours, and the increase is larger if they work between 31 and 45 weekly hours (the most common working hours category; see Table 4.3). Among self-employed men, having children is related to an additional 0.03 SD (0.01 SD) increase in satisfaction with hours for those who work either 31-45 (46 plus) weekly hours, relative to those who work 31-45 (46 plus) weekly hours and have no children. Among male employees (column 12, Table 4.9B), having a child is related to an additional 0.02 SD increase in satisfaction with hours if they work 31-45 weekly hours, relative to those who work 31-45 weekly hours and have no children. For male employees with children who work 46 plus weekly hours, satisfaction with hours is 0.02 SD lower than for those who work 46 plus weekly hours and have no children. This supports the evidence of a traditional division of household labour in Italian families, where men with children may prefer to work longer as they are usually the main bread winners in Italian household.

To conclude, self-employed females are significantly more satisfied with hours than their male counterparts even after controlling for hours of work and having children. In contrast, female employees are less satisfied with hours than male employees. Hence, the higher satisfaction with hours of self-employed women cannot be attributed to the fact

that self-employment provides an opportunity to work less hours, but there appears be something about self-employment that makes women more satisfied with their working hours. An explanation from the literature is that women have a preference for control over working hours and self-employment represents a flexible solution that allows them to combine family and career (e.g. Carr, 1996, Boden, 1999; Allen and Curington, 2014).

The level of satisfaction with respect to hours worked differs across types of self-employment. Self-employed individuals with employees (entrepreneur, freelance with employees, small business owners with employees) are more satisfied with hours compared to own-account workers, and the increase in satisfaction with hours associated with these categories is larger for self-employed women compared to self-employed men. One potential explanation for this result may be that the higher levels of satisfaction with hours for categories of self-employment with employees may reflect greater earnings, since firm revenue is positively correlated with business size (Parker, 2009). However, this would not explain why the increase in satisfaction with hours is larger for females, since existing studies have shown that men are more likely to select into self-employment due to a preference for higher earnings, while women have a preference for the flexibility offered by being self-employed (see Section 4.2.1). An alternative explanation may be that these types of self-employment may offer more flexibility because other workers may run the business when the owners have to dedicate time to domestic responsibilities. In addition, a positive relationship is found between satisfaction with hours and being self-employed in a family business, also suggesting a potential link between time flexibility and satisfaction with hours.

4.7 Conclusion

In this chapter, we have investigated the determinants of female self-employment, using data from the Italian Labour Force Survey (LFS). Previous studies have focused on the extensive margins of labour supply, defined as the probability of being self-employed

compared to being wage-employed. We have also analysed the determinants of different types of self-employment (specifically, being an entrepreneur, own-account professional freelance, professional freelance with employees, small-business owner, small-business owner with employees, or family worker). In addition, we have examined the determinants of hours supplied by self-employed women (i.e. intensive margins of labour supply) and the determinants of satisfaction with respect to their work hours, which has not attracted a great deal of attention due to data shortage.

Our findings showed little evidence of gender differences in the determinants of self-employment. In fact, the main differences were related to the regional distribution of the self-employed across the country. While self-employed men were more concentrated in the prosperous regions of Italy (North and Central Italy), women were more likely to be self-employed in regions with high unemployment rates (South and the Islands). This may reflect the possibility that women residing in the South are pushed into self-employment due to the difficult access to wage-employment. Rosti and Chelli (2005) used aggregate data to show that Italian women were more likely to become self-employed because discrimination excluded them from wage-employment. Our results suggest that this mechanism may be especially pronounced in Southern regions, where the labour force participation of females is particularly low and women have traditionally devoted their time to domestic work (see also Chapter 2, Section 2.1). We stressed the importance of the role played by household composition for a female's employment status. Existing literature has shown that the presence of dependent children in the household and marital status positively affect a female's probability of being self-employed but have little impact on that of men (Parker, 2009). Our findings were not in line with these studies. We found that, in Italy, the number of dependent children and the presence of a cohabiting partner – independent of his/her employment status – were

positively related to the probability of being self-employed for both males and females. In addition, these associations were not of similar magnitude for males and females.

With respect to the analysis of different types of self-employment, women were less likely to work in categories that involve management of other employees (entrepreneurs, freelance with employees, or small business with employees). This may be partly explained by the fact that these categories are associated with larger increases in hours worked. However, women were more likely to be self-employed with employees in the less prosperous areas of the country such as Southern Italy and on the Islands. Since in these regions the availability of childcare is particularly low and women have been traditionally more committed to household responsibilities, they may need support from other workers if they want to run their own business. In this context, the lack of childcare (as well as services for the care of elderly) may be seen as an additional start-up cost that women have to face in order to be able to run their own business. Hence, policy-makers who are interested in increasing the attractiveness of female self-employment may want to consider the introduction of policies aimed at reducing the cost of hiring additional employees in deprived regions.

Regarding the relationship between household composition and the type of self-employment, we found that the association between having children and the probability of being a family worker was negative for men but positive for women. While men may be reluctant to take non-standard jobs (as they usually are the main bread winners in the households), women with children may prefer the potential flexibility offered by this work arrangement.

We found some differences between men and women at the intensive margin of labour supply, i.e. hours worked. Controls for family members were inversely associated with the hours worked by self-employed women but positively related to the hours supplied by self-employed men. This is consistent with the hypothesis of a traditional

division of household work in Italian families. Since women are, on average, more committed to doing the domestic work, they may substitute hours from work to household work. In contrast, men may increase their working hours in response to a larger family as they usually are the main bread winners in the household.

Regarding the determinants of satisfaction with hours, our findings have shown that, for self-employed women, having children was related to an increase in satisfaction with hours when they work longer than 30 weekly hours, whereas mothers working as employees were less satisfied than their childless counterparts when they work longer than 30 weekly hours. The flexibility offered by self-employment is more compatible with childcare responsibilities, which in Italian families are more often carried by women. We have also found that, keeping working hours constant, the level of satisfaction of hours of self-employed women was significantly higher than their male counterparts, whereas there was little difference in the levels of satisfaction with working hours between male employees and female employees. This suggests that the higher satisfaction with hours of self-employed women could not only be attributed to the fact that self-employment provides the possibility to work fewer hours, but there is something about self-employment that makes women more satisfied with their working hours. A possible explanation is that women have a preference for being able to control their working hours and self-employment represents a flexible solution that allows them to change their working time in response to domestic responsibilities.

Rosti and Chelli (2005) used aggregate data to show that in Italy gender discrimination altered the distribution of entrepreneurial talent between men and women because the difficult access of women to wage-jobs would push less experienced (or less talented) women into self-employment. This can lead to labour market inefficiencies because less experienced entrepreneurs tend to perform poorly and have a lower probability of surviving in self-employment. The current chapter has explored additional

dimensions as we have also investigated the relationships between household composition and both hours worked and satisfaction with hours (which may be regarded as proxies for work effort and linked to worker productivity (Parker, 2009)). In particular, we have argued that social norms such as the unbalanced division of household production may constrain the hours that women can dedicate to their business, with other potential negative effects on worker productivity and entrepreneurial performance for females. Hence, the adoption of family-friendly policies aimed at balancing the demands of family and employment for women, such as increasing public investments in childcare, may increase both the hours supplied and the job satisfaction of women, with potential benefits on the entire Italian economy.

This chapter has contributed to the existing literature in several ways. First, it has investigated the labour supply of self-employed women using Italian data. This has not received a great deal of attention despite the fact that in Italy there is a large gap in the self-employment rates between men and women (OECD, 2018a). Second, the chapter has investigated the determinants of different types of self-employment which has allowed for a more complete analysis of self-employment compared to previous studies. It has been shown that types of self-employment differ in terms of hours worked, and satisfaction with respect to working hours. Third, the chapter has examined the determinants of hours worked by the self-employed, which has received limited attention due to a shortage of data. Fourth, the chapter has explored the determinants of satisfaction with respect to the hours worked of self-employed individuals, which has also received little attention in the existing literature despite job satisfaction having been linked to worker productivity and well-being.

From a methodological point of view, a weakness of the analysis presented in this chapter can be attributed to the use of cross-sectional data rather than panel data. In fact, the availability of panel data would help to control for unobserved factors affecting both

labour supply and hours satisfaction. However, the longitudinal version of the data provided by Istat could not be used in the present study because it did not include important information such as self-employment types, household structure and satisfaction with hours worked. Future research may want to focus on designing longitudinal surveys that elicit this information.

4.8 Tables

Table 4.1 - Sample exclusions

	Observations	Percentage of the surveyed population
Total number of observations in the dataset	5,278,129	100%
Exclusions		
Individuals of non-working age (younger than16 or older than 66)	1,984,421	37.60%
Unemployed and inactive in working age	1,512,524	28.66%
Pseudo-employees	25,991	0.49%
Members of cooperatives	3,230	0.06%
Individuals with more than one job	26,495	0.50%
Total number of observations excluded	3,552,661	67.31%
Total number of usable observations	1,725,468	32.69%

Missing values - sample from 2009 to 2017

	Observations	Percentage of the surveyed population
Total number of observations (employees and self-employed individuals observed in the period from 2009 to 2017)	1,725,468	100%
Missing values		
Hours worked	13,067	0.76%
Other training	14,016	0.81%
Total number of missing values	24,083	1.39%
Total number of usable observations	1,701,361	98.61%

Missing values - sample from 2013 to 2017

	Observations	Percentage of the surveyed population
Total number of usable observations (employees and self-employed individuals observed in the period from 2013 to 2017)	862,491	100%
Missing values		
Satisfaction with respect to working hours	25,515	2.96%
Total number of usable observations	836,976	97.04%

Table 4.1. A - Number of observations for each sample analysed

Period of analysis: 2009 to 2017				
Sample analysed	*All*	*Females*	*Males*	*Model of interest*
Total	1,701,361	724,219	977,142	Equations (4.1), (4.2)
Self-employed	390,947	118,614	272,333	Equation (4.3)
Employees	1,308,460	605,001	703,459	Equation (4.3)

Period of analysis: 2013 to 2017				
Sample analysed	*All*	*Females*	*Males*	*Model of interest*
Total	832,737	363,281	469,456	Equation (4.4)
Self-employed	188,741	59,317	129,424	Equation (4.4)
Employees	643,996	303,964	340,032	Equation (4.4)

Table 4.2 - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
Outcome variables		
Self-Employed	dep_var1	Binary variable (0, 1). 1 if individual is self-employed; 0 if wage-employed.
Occupation category	dep_var2	Categorical variable (0 – 6). Corresponding to 7 occupational categories: employee, entrepreneur, freelancer, freelancer with employees, small business owner, small business with employees, family business
Usual hours worked	lusual_hours_worked	Continuous variable. Number of usual weekly hours worked by the respondent (in log).
Hours satisfaction	hours_satisfaction	Categorical variable (0 – 10). Self-reported index of satisfaction with respect to working hours.
Hours satisfaction (std)	hours_satisfaction1	Continuous variable. Standardised hours satisfaction index.
Explanatory Variables		
Male	male	Binary variable (0, 1). 1 if individual is male; 0 otherwise.
Female	female	Binary variable (0, 1). 1 if individual is female; 0 otherwise.
Age	age	Continuous variable in years.
North-West	northwest	Binary variable (0, 1). 1 if individual is resident in the North-West (Piemonte, Liguria, Lombardia, Val D'Aosta); 0 otherwise.
North-East	northeast	Binary variable (0, 1). 1 if individual is resident in the North-East (Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Emilia Romagna); 0 otherwise.
Centre	centre	Binary variable (0, 1). 1 if individual is resident in one of the six central Regions (Toscana, Umbria, Marche, Lazio, Abruzzo, Molise); 0 otherwise.
South	south	Binary variable (0, 1). 1 if the individual is resident in one of the four Southern regions (Campania, Basilicata, Puglia, Calabria); 0 otherwise.
Islands	islands	Binary variable (0, 1). 1 if individual is resident in either Sicilia or Sardegna; 0 otherwise.
Italian	italian	Binary variable (0, 1). 1 if nationality is Italian; 0 if the nationality is different from Italian.
Foreign (EU)	foreign_eu	Binary variable (0, 1). 1 if nationality is not Italian but from another EU country; 0 otherwise.
Foreign (non-EU)	foreign_extraeu	Binary variable (0, 1). 1 if nationality is from a non-EU country; 0 otherwise.
Low Level of Education Attained	loweducation	Binary variable (0, 1). 1 if the highest level of education attained by the individual is primary school; 0 otherwise.
Middle Level of Education Attained	high_school	Binary variable (0, 1). 1 if the highest level of education attained by the individual is a high school diploma; 0 otherwise.
High Level of Education Attained	higheducation	Binary variable (0, 1). 1 if the highest level of education attained by the individual is a university degree; 0 otherwise.
Other training attained	other_training	Binary variable (0, 1). 1 if the individual received training other than formal education; 0 otherwise.

Table 4.2 (continued) - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
No partner	nopartner	Binary variable (0, 1). 1 if the reference person has no partner; 0 otherwise.
Unemployed partner	unemployed_part	Binary variable (0, 1). 1 if the partner of the reference person is unemployed; 0 otherwise.
Inactive partner	inactive_part	Binary variable (0, 1). 1 if the partner of the reference person is inactive; 0 otherwise.
Employee partner	employee_part	Binary variable (0, 1). 1 if the partner of the reference person is an employee; 0 otherwise.
Self-employed partner	selfemployed_part	Binary variable (0, 1). 1 if the partner of the reference person is self-employed; 0 otherwise.
Dependent children	own_children	Continuous variable. Number of children younger than 16 living in the household.
Agriculture	agriculture	Binary variable (0, 1). 1 if the individual is employed in the agriculture sector; 0 otherwise.
Industry	industry	Binary variable (0, 1). 1 if the individual is employed in the industry sector; 0 otherwise.
Construction	construction	Binary variable (0, 1). 1 if the individual is employed in the construction sector; 0 otherwise.
Commerce	commerce	Binary variable (0, 1). 1 if the individual is employed in commerce; 0 otherwise.
Hotels and restaurants	hotels	Binary variable (0, 1). 1 if the individual is employed in the 'Hotels and restaurants' sector; 0 otherwise.
Transport	transport	Binary variable (0, 1). 1 if the individual is employed in the transport sector; 0 otherwise.
Info and communication	info_and_communication	Binary variable (0, 1). 1 if the individual is employed in the 'Information and communication' sectors; 0 otherwise.
Financial	financial	Binary variable (0, 1). 1 if the individual is employed in the financial sector; 0 otherwise.
Real estate	real estate	Binary variable (0, 1). 1 if the individual is employed in the real estate sector; 0 otherwise.
Public administration	public administration	Binary variable (0, 1). 1 if the individual is employed in one of the following sectors: public administration sector, education, health, and 'other personal services'; 0 otherwise.
Job tenure	job_tenure_years	Continuous variable. Number of years working in the same job.
1-15 hours	h0_15	Binary variable (0, 1). 1 if the individual works between 1 and 15 hours per week; 0 otherwise.
16-30 hours	h16_30	Binary variable (0, 1). 1 if the individual works between 16 and 30 hours per week; 0 otherwise.
31-45 hours	h31_45	Binary variable (0, 1). 1 if the individual works between 31 and 45 hours per week; 0 otherwise.
46+ hours	h46plus	Binary variable (0, 1). 1 if the individual works more than 45 hours per week; 0 otherwise.
entrepreneur	entrepreneur	Binary variable (0, 1). 1 if the individual is an entrepreneur; 0 otherwise.
freelancer	freelancer	Binary variable (0, 1). 1 if the individual is a freelance professional without employees; 0 otherwise.
freelancer (with empl)	freelancer_wempl	Binary variable (0, 1). 1 if the individual is a freelance professional with employees; 0 otherwise.
small business owner	small_business_owner	Binary variable (0, 1). 1 if the individual owns a small business without employees; 0 otherwise.
small business owner (with empl)	small_business_owner_wempl	Binary variable (0, 1). 1 if the individual owns a small business with employees; 0 otherwise.
family business	family_business	Binary variable (0, 1). 1 if the individual is self-employed, working in a family business; 0 otherwise.

Table 4.2 (continued) - Definition of the variables used in the main analysis

Variable	Abbreviation	Description
year (2009)	y2009	Binary variable (0, 1). 1 if the individual was interviewed in 2009; 0 otherwise.
year (2010)	y2010	Binary variable (0, 1). 1 if the individual was interviewed in 2010; 0 otherwise.
year (2011)	y2011	Binary variable (0, 1). 1 if the individual was interviewed in 2011; 0 otherwise.
year (2012)	y2012	Binary variable (0, 1). 1 if the individual was interviewed in 2012; 0 otherwise.
year (2013)	y2013	Binary variable (0, 1). 1 if the individual was interviewed in 2013; 0 otherwise.
year (2014)	y2014	Binary variable (0, 1). 1 if the individual was interviewed in 2014; 0 otherwise.
year (2015)	y2015	Binary variable (0, 1). 1 if the individual was interviewed in 2015; 0 otherwise.
year (2016)	y2016	Binary variable (0, 1). 1 if the individual was interviewed in 2016; 0 otherwise.
year (2017)	y2017	Binary variable (0, 1). 1 if the individual was interviewed in 2017; 0 otherwise.
quarters (from 20091q to 20172q)	2009q1 - 2017q2	Binary variable (0, 1). 1 if the individual was interviewed in the quarter of reference; 0 otherwise.

Table 4.3 - Summary Statistics. Categorical variables

Samples	Self-employed + Employees			Self-employed			Employees		
	All	Females	Males	All	Females	Males	All	Females	Males
Variable	%	%	%	%	%	%	%	%	%
Dependent variables									
employee	76.98	83.60	72.08	-	-	-	100	100	100
self-employed	23.02	16.40	27.92	100	100	100	-	-	-
entrepreneur	1.00	0.52	1.35	4.33	3.19	4.82	-	-	-
family business	1.63	2.30	1.14	7.10	14.05	4.08	-	-	-
freelancer	4.25	3.41	4.87	18.46	20.81	17.43	-	-	-
freelancer (with empl)	0.85	0.51	1.11	3.70	3.11	3.96	-	-	-
small business	10.45	6.69	13.25	45.43	40.80	47.44	-	-	-
small business (with empl)	4.83	2.96	6.22	20.98	18.03	22.27	-	-	-
Explanatory variables									
male	57.43	-	-	69.68	-	-	53.77	-	-
female	42.57	-	-	30.32	-	-	46.23	-	-
italian	90.75	90.24	91.13	95.08	95.35	94.97	89.45	89.24	89.64
foreign (EU)	3.01	3.87	2.37	1.37	1.84	1.16	3.50	4.27	2.84
foreign (extra-EU)	6.24	5.89	6.50	3.55	2.81	3.87	7.05	6.49	7.52
north-west	28.94	30.31	27.93	28.13	29.28	27.63	29.19	30.52	28.04
north-east	23.62	24.89	22.67	21.67	21.71	21.65	24.20	25.52	23.07
centre	18.42	19.13	17.89	18.88	20.12	18.34	18.28	18.93	17.71
south	19.26	16.96	20.96	21.32	19.96	21.92	18.64	16.37	20.59
islands	9.77	8.71	10.55	9.99	8.92	10.46	9.70	8.66	10.59

Table 4.3 (continued) - Summary Statistics. Categorical variables

Samples	Self-employed + Employees			Self-employed			Employees		
	All	Females	Males	All	Females	Males	All	Females	Males
Variable	%	%	%	%	%	%	%	%	%
low education	35.49	28.23	40.88	40.24	34.47	42.76	34.07	27.01	40.15
vocational	8.40	8.40	8.40	7.27	7.67	7.09	8.74	8.54	8.90
high school diploma	39.78	42.79	37.55	34.77	34.47	34.90	41.28	44.42	38.57
high education	17.87	23.00	14.07	18.73	25.06	15.97	17.62	22.60	13.34
other training	11.58	13.40	10.23	10.83	11.85	10.39	11.81	13.71	10.17
no partner	33.76	36.01	32.09	29.19	30.68	28.56	35.11	37.04	33.44
inactive partner	19.25	9.54	26.44	22.45	9.77	27.96	18.29	9.50	25.86
unemployed partner	2.70	2.21	3.07	2.13	1.67	2.33	2.88	2.32	3.36
employee partner	33.62	36.33	31.61	25.37	22.68	26.54	36.09	39.01	33.58
self-employed partner	10.67	15.91	6.79	20.86	35.20	14.61	7.63	12.13	3.76
agriculture	4.28	3.01	5.21	9.41	9.38	9.43	2.74	1.77	3.58
industry	20.21	12.47	25.95	10.41	7.63	11.62	23.14	13.42	31.51
construction	7.61	1.11	12.44	12.68	1.61	17.50	6.10	1.01	10.47
commerce	14.35	14.28	14.40	25.07	27.11	24.18	11.14	11.76	10.61
hotels	5.73	7.28	4.58	7.86	11.58	6.24	5.09	6.44	3.93
transport	4.56	2.27	6.25	2.43	0.97	3.06	5.19	2.52	7.48
info_and_communication	1.85	1.37	2.21	1.59	1.05	1.82	1.93	1.43	2.36
financial	2.71	2.83	2.62	1.91	1.64	2.03	2.95	3.06	2.85
real estate	9.74	11.23	8.63	17.21	19.24	16.33	7.51	9.67	5.65
public administration	6.60	5.65	7.30	-	-	-	8.57	6.75	10.13
education_health	15.53	27.03	7.01	4.84	8.00	3.46	18.73	30.76	8.39
other_services	6.83	11.47	3.39	6.59	11.79	4.33	6.90	11.41	3.03

Table 4.3 (continued) - Summary Statistics. Categorical variables

Samples	Self-employed + Employees			Self-employed			Employees		
	All	Females	Males	All	Females	Males	All	Females	Males
Variable	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
h0_15	3.15	5.73	1.24	3.47	6.91	1.97	3.06	5.50	0.95
h16_30	18.73	33.48	7.80	11.92	21.47	7.76	20.76	35.83	7.81
h31_45	65.11	53.76	73.52	45.64	43.50	46.57	70.93	55.77	83.96
h46plus	12.90	6.95	17.31	38.81	28.01	43.51	5.15	2.82	7.16
2009	12.94	12.48	13.28	13.35	12.85	13.56	12.82	12.41	13.17
2010	12.81	12.48	13.06	13.22	12.68	13.46	12.69	12.44	12.91
2011	12.48	12.26	12.65	12.62	12.22	12.80	12.44	12.26	12.59
2012	11.52	11.51	11.53	11.47	11.39	11.50	11.54	11.54	11.54
2013	11.37	11.50	11.26	11.35	11.48	11.30	11.37	11.51	11.25
2014	11.19	11.40	11.04	11.12	11.30	11.04	11.21	11.42	11.04
2015	11.07	11.33	10.88	10.87	11.26	10.70	11.13	11.34	10.95
2016	11.04	11.32	10.83	10.67	11.25	10.42	11.15	11.33	11.00
2017	5.57	5.72	5.46	5.33	5.58	5.22	5.65	5.75	5.55
Observations	1,701,361	724,219	977,142	391,577	118,740	272,837	1,309,784	605,479	704,305

Table 4.4 - Summary Statistics. Continuous variables. Period of analysis: 2009 - 2017

Sample		All					Females					Males				
	Variables	**Mean**	**SD**	**Min**	**Max**	**Obs**	**Mean**	**SD**	**Min**	**Max**	**Obs**	**Mean**	**SD**	**Min**	**Max**	**Obs**
Self-						1,701,361					724,219					977,142
employed	hours worked (log)	3.57	0.38	0	4.87		3.43	0.43	0	4.65		3.67	0.28	0	4.87	
+ Employees	age	43.60	10.73	16	66	1,701,361	43.52	10.49	16	66	724,219	43.66	10.90	16	66	977,142
	own children	0.52	0.81	0	10	1,701,361	0.49	0.78	0	6	724,219	0.55	0.84	0	10	977,142
	job tenure (years)	12.99	10.76	0	57	1,701,361	12.15	10.47	0	54	724,219	13.62	10.94	0	57	977,142
	hours worked (log)	3.71	0.44	0	4.87	391,577	3.56	0.53	0	4.65	118,740	3.77	0.37	0	4.87	272,837
Self-						391,577					118,740					272,837
employed	age	45.77	10.51	16	66		45.03	10.27	16	66		46.10	10.59	16	66	
	own children	0.54	0.84	0	8	391,577	0.51	0.81	0	6	118,740	0.56	0.85	0	8	272,837
	job tenure (years)	15.53	11.35	0	57	391,577	13.52	10.69	0	54	118,740	16.40	11.52	0	57	272,837
	hours worked (log)	3.56	0.35	0	4.65	1,309,784	3.40	0.41	0	4.65	605,479	3.64	0.23	0	4.65	704,305
Employees	age	42.95	10.70	16	66	1,309,784	43.22	10.50	16	66	605,479	42.72	10.87	16	66	704,305
	own children	0.52	0.80	0	10	1,309,784	0.48	0.77	0	6	605,479	0.55	0.83	0	10	704,305
	job tenure (years)	12.24	10.46	0	53	1,309,784	11.89	10.41	0	52	605,479	12.54	10.50	0	53	704,305

Table 4.4 - Summary Statistics. Job satisfaction. Period of analysis: 2013 - 2017

Sample		All					Females					Males				
	Variable	**Mean**	**SD**	**Min**	**Max**	**Obs**	**Mean**	**SD**	**Min**	**Max**	**Obs**	**Mean**	**SD**	**Min**	**Max**	**Obs**
Self-employed	hours satisfaction	7.12	1.77	0	10	832,737	7.15	1.79	0	10	363,281	7.09	1.75	0	10	469,456
+ Employees	hours satisfaction (stand.)	0.01	1.00	-4	1.63	832,737	0.02	1.00	-4	1.63	363,281	-0.01	0.98	-4	1.63	469,456
Self-	hours satisfaction	6.64	1.90	0	10	188,741	6.75	1.87	0	10	59,317	6.59	1.90	0	10	129,424
employed	hours satisfaction (stand.)	-0.26	1.07	-4	1.63	188,741	-0.20	1.06	-4	1.63	59,317	-0.28	1.07	-4	1.63	129,424
	hours satisfaction	7.26	1.70	0	10	643,996	7.23	1.76	0	10	303,964	7.28	1.65	0	10	340,032
Employees	hours satisfaction (stand.)	0.09	0.96	-4	1.63	643,996	0.07	0.99	-4	1.63	303,964	0.10	0.93	-4	1.63	340,032

Table 4.5 - Probit model. Dependent variable: 0 = employed; 1 = self-employed; marginal effects sample = employed and self-employed individuals

Column	(1)	(2)	(3)
Sample	all	females	males
Explanatory variables	margins	margins	margins
Personal characteristics			
female	-0.100***	-	-
	(0.001)		
age	0.003***	0.002***	0.004***
	(0.000)	(0.000)	(0.000)
age2	-0.000**	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)
foreign_eu[1]	-0.083***	-0.048***	-0.121***
	(0.002)	(0.003)	(0.003)
foreign_extraeu[1]	-0.080***	-0.056***	-0.095***
	(0.002)	(0.002)	(0.002)
Region[2]			
northwest	-0.001	-0.016***	0.012***
	(0.001)	(0.001)	(0.001)
northeast	-0.012***	-0.034***	0.007***
	(0.001)	(0.001)	(0.001)
centre	0.006***	-0.004***	0.015***
	(0.001)	(0.001)	(0.001)
islands	-0.012***	-0.005***	-0.013***
	(0.001)	(0.002)	(0.002)
Education			
vocational[3]	-0.017***	-0.017***	-0.015***
	(0.001)	(0.002)	(0.002)
high_school_diploma[3]	-0.010***	-0.036***	0.011***
	(0.001)	(0.001)	(0.001)
uni_education[3]	0.070***	0.046***	0.083***
	(0.001)	(0.001)	(0.001)
other_training	0.016***	0.011***	0.019***
	(0.001)	(0.001)	(0.001)
Household composition			
inactive_part[4]	-0.025***	-0.013***	-0.029***
	(0.001)	(0.002)	(0.001)
unempl_part[4]	-0.049***	-0.029***	-0.063***
	(0.002)	(0.003)	(0.003)
employee_part[4]	-0.054***	-0.049***	-0.061***
	(0.001)	(0.001)	(0.001)
selfemployed_part[4]	0.145***	0.118***	0.171***
	(0.001)	(0.001)	(0.002)
own_children	0.016***	0.009***	0.020***
	(0.000)	(0.001)	(0.001)
Other control variables[5]	included	included	included
Observations	1,701,361	724,219	977,142

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Nationality: Italian; 2- Region: South; 3- Education: low education; 4- Partner's employment status: no cohabiting partner. 5- Other explanatory variables included: job tenure, sector of employment, quarter.

Table 4.6 - MNL of self-employment occupations; Relative Risk Ratios (RRR); sample = employed and self-employed individuals

	(1)	(2)	(3)	(4)	(5)	(6)
	Entrepr.	Freelance	Freelance (emp)	Small business	Small business (emp)	Family business
Explanatory variables	RRR	RRR	RRR	RRR	RRR	RRR
Personal characteristics						
female	0.420***	0.374***	0.267***	0.534***	0.437***	1.478***
	(0.008)	(0.003)	(0.005)	(0.004)	(0.004)	(0.022)
age	1.076***	1.050***	1.164***	1.048***	1.071***	0.829***
	(0.007)	(0.004)	(0.010)	(0.002)	(0.003)	(0.003)
age2	1.000***	1.000***	0.999***	1.000***	0.999***	1.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
foreign_eu[1]	0.312***	0.584***	0.396***	0.688***	0.335***	0.233***
	(0.029)	(0.025)	(0.046)	(0.014)	(0.013)	(0.016)
foreign_extraeu[1]	0.295***	0.242***	0.104***	0.800***	0.395***	0.540***
	(0.019)	(0.011)	(0.016)	(0.010)	(0.009)	(0.020)
Region[2]						
northwest	0.879***	1.145***	1.571***	0.887***	1.101***	1.255***
	(0.021)	(0.014)	(0.043)	(0.007)	(0.013)	(0.026)
northeast	0.994	0.987	1.592***	0.797***	1.063***	1.184***
	(0.024)	(0.013)	(0.045)	(0.007)	(0.013)	(0.025)
centre	0.872***	1.154***	1.434***	0.963***	1.172***	1.131***
	(0.023)	(0.015)	(0.042)	(0.009)	(0.015)	(0.026)
islands	0.828***	0.929***	0.995	0.899***	0.997	0.890***
	(0.027)	(0.015)	(0.038)	(0.009)	(0.015)	(0.026)
Education						
vocational[3]	1.015	1.385***	1.017	0.851***	0.918***	0.915***
	(0.036)	(0.047)	(0.092)	(0.009)	(0.013)	(0.020)
high_school_diploma[3]	2.360***	3.998***	4.642***	0.751***	0.973***	0.756***
	(0.046)	(0.073)	(0.197)	(0.005)	(0.009)	(0.012)
uni_education[3]	3.579***	16.637***	25.336***	0.464***	0.669***	0.482***
	(0.103)	(0.301)	(1.062)	(0.006)	(0.012)	(0.015)
other_training	1.189***	1.128***	1.025	1.118***	1.256***	0.847***
	(0.030)	(0.015)	(0.029)	(0.010)	(0.015)	(0.020)
Household composition						
inactive_part[4]	0.876***	0.796***	0.935**	0.832***	0.935***	0.428***
	(0.024)	(0.012)	(0.028)	(0.007)	(0.012)	(0.012)
unempl_part[4]	0.471***	0.742***	0.466***	0.812***	0.584***	0.334***
	(0.033)	(0.025)	(0.043)	(0.014)	(0.017)	(0.026)
employee_part[4]	0.783***	0.697***	0.746***	0.632***	0.803***	0.347***
	(0.020)	(0.009)	(0.019)	(0.005)	(0.010)	(0.009)
selfemployed_part[4]	2.986***	1.720***	2.370***	2.076***	3.454***	9.469***
	(0.088)	(0.028)	(0.073)	(0.022)	(0.049)	(0.165)
own_children	1.314***	1.055***	1.198***	1.098***	1.205***	0.994
	(0.015)	(0.007)	(0.015)	(0.004)	(0.007)	(0.010)
Other control variables[5]	included	included	included	included	included	included
Observations	1,701,361	1,701,361	1,701,361	1,701,361	1,701,361	1,701,361

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Omitted category of the dependent variable: employee. Reference categories (explanatory variables): 1- Nationality: Italian; 2- Region: South; 3- Education: low education; 4- Partner's employment status: no cohabiting partner; 5- Other explanatory variables included: job tenure, sector of employment, quarter.

Table 4.7 - MNL of self-employment occupations by gender. Relative Risk Ratios (RRR); sample = employed and self-employed individuals

Sample	females						males					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Entrepr	freelance	Freelance (emp)	Small business	Small business (emp)	Family business	Entrepr	freelance	Freelance (emp)	Small business	Small business (emp)	Family business
Explanatory variables	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR
Personal characteristics												
age	1.039***	1.080***	1.195***	1.026***	1.058***	0.861***	1.083***	1.050***	1.146***	1.061***	1.075***	0.824***
	(0.015)	(0.007)	(0.021)	(0.004)	(0.006)	(0.005)	(0.008)	(0.004)	(0.012)	(0.002)	(0.004)	(0.005)
age2	1.000	0.999***	0.999***	1.000	1.000***	1.002***	1.000***	1.000***	0.999***	1.000***	0.999***	1.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
foreign_eu[1]	0.524***	0.703***	0.244***	0.783***	0.445***	0.371***	0.240***	0.430***	0.450***	0.616***	0.274***	0.132***
	(0.073)	(0.038)	(0.056)	(0.026)	(0.027)	(0.031)	(0.028)	(0.028)	(0.062)	(0.015)	(0.014)	(0.019)
foreign_extraeu[1]	0.627***	0.299***	0.183***	0.761***	0.655***	0.805***	0.242***	0.195***	0.071***	0.803***	0.331***	0.393***
	(0.073)	(0.019)	(0.042)	(0.020)	(0.028)	(0.039)	(0.018)	(0.012)	(0.015)	(0.011)	(0.009)	(0.021)
Region												
northwest[2]	0.741***	1.113***	1.369***	0.700***	0.952**	1.200***	0.955*	1.205***	1.705***	0.993	1.184***	1.303***
	(0.037)	(0.023)	(0.074)	(0.010)	(0.022)	(0.035)	(0.025)	(0.019)	(0.053)	(0.010)	(0.016)	(0.039)
northeast[2]	0.798***	0.889***	1.432***	0.547***	0.823***	1.193***	1.109***	1.084***	1.725***	0.947***	1.205***	1.076**
	(0.041)	(0.020)	(0.080)	(0.009)	(0.020)	(0.035)	(0.030)	(0.018)	(0.056)	(0.010)	(0.017)	(0.034)
centre[2]	0.735***	1.103***	1.263***	0.840***	1.108***	1.142***	0.935**	1.213***	1.530***	1.024**	1.206***	1.102***
	(0.042)	(0.025)	(0.073)	(0.013)	(0.027)	(0.037)	(0.028)	(0.020)	(0.051)	(0.011)	(0.018)	(0.037)
islands[2]	1.240***	0.948*	1.179**	0.914***	1.089***	1.089**	0.747***	0.929***	0.937	0.917***	0.975	0.754***
	(0.082)	(0.026)	(0.084)	(0.018)	(0.034)	(0.046)	(0.028)	(0.018)	(0.041)	(0.011)	(0.017)	(0.031)
Education												
vocational[3]	1.314***	1.822***	1.068	0.825***	0.853***	0.921***	0.947	1.373***	1.029	0.881***	0.947***	0.827***
	(0.092)	(0.114)	(0.178)	(0.015)	(0.023)	(0.027)	(0.038)	(0.056)	(0.110)	(0.011)	(0.016)	(0.030)
high_school_diploma[3]	2.083***	4.144***	4.324***	0.620***	0.783***	0.628***	2.491***	4.298***	5.037***	0.847***	1.087***	0.920***
	(0.095)	(0.166)	(0.415)	(0.008)	(0.014)	(0.013)	(0.054)	(0.088)	(0.236)	(0.007)	(0.011)	(0.021)
uni_education[3]	2.713***	28.090***	28.135***	0.435***	0.591***	0.388***	3.839***	13.277***	23.954***	0.463***	0.680***	0.724***
	(0.162)	(1.093)	(2.644)	(0.009)	(0.018)	(0.016)	(0.126)	(0.279)	(1.114)	(0.008)	(0.016)	(0.037)
other_training	1.287***	1.032	0.921	1.166***	1.229***	0.851***	1.154***	1.183***	1.078**	1.084***	1.251***	0.894***
	(0.063)	(0.022)	(0.049)	(0.018)	(0.027)	(0.027)	(0.034)	(0.020)	(0.036)	(0.012)	(0.018)	(0.032)

Table 4.7 (continued) - MNL of self-employment occupations by gender. Relative Risk Ratios (RRR); sample = employed and self-employed individuals

Sample	females						males					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Entrepr	freelance	Freelance (emp)	Small business	Small business (emp)	Family business	Entrepr	freelance	Freelance (emp)	Small business	Small business (emp)	Family business
Explanatory variables	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR	RRR
Household composition												
inactive_part[4]	0.591***	0.692***	0.662***	1.137***	0.763***	0.627***	1.010	0.813***	1.050	0.786***	1.038**	0.392***
	(0.041)	(0.025)	(0.049)	(0.020)	(0.022)	(0.029)	(0.032)	(0.015)	(0.036)	(0.008)	(0.016)	(0.015)
unempl_part[4]	0.488***	0.694***	0.383***	1.014	0.571***	0.429***	0.496***	0.759***	0.509***	0.728***	0.609***	0.314***
	(0.078)	(0.045)	(0.083)	(0.033)	(0.037)	(0.053)	(0.039)	(0.030)	(0.052)	(0.015)	(0.021)	(0.032)
employee_part[4]	0.565***	0.651***	0.599***	0.653***	0.654***	0.476***	0.887***	0.714***	0.835***	0.608***	0.884***	0.293***
	(0.028)	(0.013)	(0.028)	(0.009)	(0.014)	(0.017)	(0.026)	(0.012)	(0.026)	(0.006)	(0.013)	(0.012)
selfemployed_part[4]	2.241***	1.489***	1.877***	2.033***	2.818***	12.226***	3.627***	2.068***	2.992***	2.319***	4.169***	6.846***
	(0.103)	(0.031)	(0.086)	(0.030)	(0.057)	(0.304)	(0.122)	(0.045)	(0.113)	(0.032)	(0.072)	(0.213)
own_children	1.320***	1.023**	1.057**	1.087***	1.186***	1.107***	1.304***	1.063***	1.238***	1.117***	1.205***	0.963**
	(0.033)	(0.011)	(0.026)	(0.009)	(0.013)	(0.014)	(0.016)	(0.009)	(0.018)	(0.005)	(0.008)	(0.018)
Other control variables[5]	included	included	included	included	included	included	included	included	included	included	included	included
Observations	724,219	724,219	724,219	724,219	724,219	724,219	977,142	977,142	977,142	977,142	977,142	977,142

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Omitted category of the dependent variable: employee Reference categories: 1- Nationality: Italian; 2- Region: South; 3- Education: low education; 4- Partner's employment status: no cohabiting partner. 5- Other explanatory variables included: job tenure, sector of employment, quarter.

Table 4.8 - OLS. Dependent variable: Usual hours worked (log); sample = self-employed and employees

Sample	Self-employed			Employees		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory variables	All	Females	Males	All	Females	Males
female	-0.190***	-	-	-0.182***	-	-
	(0.002)			(0.001)		
Education						
vocational[1]	0.010***	-0.009	0.017***	0.009***	0.018***	0.004***
	(0.003)	(0.006)	(0.003)	(0.001)	(0.002)	(0.001)
high_school_diploma[1]	-0.001	-0.032***	0.014***	0.006***	0.024***	-0.005***
	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.001)
uni_education[1]	-0.008***	-0.030***	0.005	-0.003**	0.012***	-0.017***
	(0.003)	(0.005)	(0.003)	(0.001)	(0.002)	(0.001)
other_training	0.018***	0.018***	0.018***	0.026***	0.044***	0.008***
	(0.002)	(0.005)	(0.002)	(0.001)	(0.001)	(0.001)
Occupation						
freelance_prof (empl)[2]	0.151***	0.210***	0.121***	-	-	-
	(0.003)	(0.006)	(0.003)			
entrepreneur[2]	0.164***	0.180***	0.151***	-	-	-
	(0.003)	(0.009)	(0.003)			
small_business[2]	0.052***	0.080***	0.033***	-	-	-
	(0.003)	(0.006)	(0.003)			
small_business (empl) [2]	0.147***	0.196***	0.119***	-	-	-
	(0.003)	(0.006)	(0.003)			
family_business[2]	-0.091***	-0.091***	-0.038***	-	-	-
	(0.004)	(0.007)	(0.005)			
wcollar[3]	-	-	-	0.055***	0.093***	0.019***
				(0.001)	(0.001)	(0.001)
manager[3]	-	-	-	0.095***	0.112***	0.083***
				(0.001)	(0.002)	(0.001)
temporary	-	-	-	-0.077***	-0.092***	-0.065***
				(0.001)	(0.002)	(0.001)
Household composition						
inactive_part[4]	0.017***	-0.020***	0.035***	0.001	-0.064***	0.032***
	(0.002)	(0.006)	(0.002)	(0.001)	(0.002)	(0.001)
unempl_part[4]	0.010*	0.004	0.015***	-0.029***	-0.089***	0.023***
	(0.005)	(0.012)	(0.005)	(0.002)	(0.004)	(0.002)
employee_part[4]	0.018***	-0.031***	0.043***	-0.029***	-0.064***	0.017***
	(0.002)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)
selfemployed_part[4]	0.020***	-0.040***	0.076***	-0.051***	-0.085***	0.023***
	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.001)
own_children	-0.019***	-0.072***	-0.000	-0.019***	-0.057***	0.001***
	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)	(0.000)
Constant	3.096***	2.904***	3.083***	3.400***	3.294***	3.375***
	(0.013)	(0.029)	(0.014)	(0.005)	(0.009)	(0.005)
Other control variables[5]	included	included	included	included	included	included
Observations	390,947	118,614	272,333	1,308,460	605,001	703,459
R-squared	0.148	0.123	0.120	0.186	0.106	0.097

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Education: low education; 2- Self-employed occupation: freelancer; 3- Employee occupation: Blue-collar and apprenticeship; 4- Partner's employment status: no cohabiting partner. 5- Other explanatory variables included: age, age squared, nationality, region of residence, job tenure, sector of employment, year.

Table 4.9A - OLS regression. Dependent variable: hours satisfaction (standardised); sample = self-employed and employees

Sample	Self-employed			Employees		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory variables	all	females	males	all	females	males
female	0.050***	-	-	-0.007***	-	-
	(0.006)			(0.003)		
Occupation						
freelance_prof (empl) [1]	0.076***	0.100***	0.049***	-	-	-
	(0.012)	(0.023)	(0.014)			
entrepreneur[1]	0.175***	0.263***	0.122***	-	-	-
	(0.014)	(0.027)	(0.016)			
small_business[1]	-0.070***	0.000	-0.097***	-	-	-
	(0.009)	(0.015)	(0.010)			
small_business (empl) [1]	0.073***	0.131***	0.037***	-	-	-
	(0.009)	(0.017)	(0.011)			
family_business[1]	0.196***	0.245***	0.089***	-	-	-
	(0.013)	(0.019)	(0.018)			
wcollar[2]	-	-	-	0.173***	0.201***	0.131***
				(0.003)	(0.005)	(0.004)
manager[2]	-	-	-	0.192***	0.198***	0.182***
				(0.005)	(0.008)	(0.007)
temporary	-	-	-	-0.082***	-0.078***	-0.066***
				(0.004)	(0.006)	(0.005)
Household composition						
inactive_part[3]	0.039***	-0.006	0.044***	0.046***	0.030***	0.028***
	(0.008)	(0.018)	(0.009)	(0.004)	(0.007)	(0.005)
unempl_part[3]	-0.110***	-0.110***	-0.105***	-0.042***	-0.061***	-0.041***
	(0.018)	(0.035)	(0.020)	(0.007)	(0.012)	(0.009)
employee_part[3]	0.070***	0.071***	0.060***	0.035***	0.062***	-0.003
	(0.007)	(0.012)	(0.009)	(0.003)	(0.004)	(0.005)
selfemployed_part[3]	0.062***	0.046***	0.037***	0.069***	0.083***	0.005
	(0.009)	(0.012)	(0.011)	(0.005)	(0.006)	(0.009)
own_children	0.086***	0.112***	-0.130***	0.083***	0.122***	-0.227***
	(0.022)	(0.024)	(0.039)	(0.012)	(0.012)	(0.032)
Hours of work[4]						
16-30	0.628***	0.554***	0.739***	0.830***	0.880***	0.645***
	(0.022)	(0.028)	(0.033)	(0.011)	(0.013)	(0.025)
31-45	0.891***	0.584***	1.197***	1.072***	1.005***	1.188***
	(0.021)	(0.027)	(0.031)	(0.011)	(0.013)	(0.024)
46+	0.644***	0.253***	0.977***	0.682***	0.607***	0.794***
	(0.021)	(0.028)	(0.032)	(0.013)	(0.018)	(0.026)
Interactions						
16-30#own_children	-0.025	-0.024	0.053	0.039***	0.019	0.174***
	(0.023)	(0.026)	(0.041)	(0.012)	(0.013)	(0.033)
31-45#own_children	-0.057***	-0.091***	0.163***	-0.071***	-0.141***	0.251***
	(0.022)	(0.025)	(0.039)	(0.012)	(0.013)	(0.032)
46plus#own_children	-0.066***	-0.082***	0.142***	-0.101***	-0.160***	0.206***
	(0.022)	(0.027)	(0.039)	(0.014)	(0.024)	(0.033)
Constant	-0.086*	0.047	-0.134**	-0.816***	-0.917***	-0.718***
	(0.045)	(0.076)	(0.058)	(0.022)	(0.031)	(0.034)
Other control variables[5]	included	included	included	included	included	included
Observations	188,741	59,317	129,424	643,996	303,964	340,032
R-squared	0.061	0.061	0.077	0.095	0.112	0.102

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Self-employed occupation: freelancer; 2- Employee occupation: Blue-collar and apprenticeship; 3- Partner's employment status: no cohabiting partner; 4- Hours of work: 0-16. 5- Other explanatory variables included: age, age squared, nationality, region of residence, sector of employment, job tenure, year.

Table 4.9B - Associations between hours worked and satisfaction with hours (comparing individuals with and without children); samples = self-employed and employees

Sample	Self-employed						Employees					
	without children			with children			without children			with children		
	all	females	males	all	females	males	all	females	males	all	females	males
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hours worked												
16-30	0.628	0.554	0.739	0.714	0.666	0.609	0.830	0.880	0.645	0.952	0.880	0.645
				(0.086)	(0.112)	(-0.130)				(0.122)	(0.122)	(-0.053)
31-45	0.891	0.584	1.197	0.920	0.605	1.230	1.072	1.005	1.188	1.084	1.005	1.188
				(0.029)	(0.021)	(0.033)				(0.012)	(-0.019)	(0.024)
46+	0.644	0.253	0.977	0.664	0.283	0.989	0.682	0.607	0.794	0.664	0.607	0.794
				(0.020)	(0.030)	(0.012)				(-0.018)	(-0.038)	(-0.021)

NOTES: The coefficients of hours satisfaction for individuals with children are computed by adding all the statistically significant coefficients relating to 'having children' and interaction terms. For example, for self-employed individuals with children who work between 16 and 30 hours 0.714 is obtained as the sum of the following coefficients: number of hours worked (0.628), having children (0.086), and the interaction term 16-30hours#children (which is 0, at 99% confidence) (see Table 4.9A). The coefficients in parenthesis represent the difference in satisfaction with hours between individuals with children and individuals without children.

Appendix D

Table D.1 - 1st Stage Multinomial Logit. Dependent variable: 0: inactive or unemployed; 1: employee 2: employee; sample = all individuals in working age

Sample	All		Females		Males	
Subsample	SE	Emp	SE	Emp	SE	Emp
Explanatory variables	RRR	RRR	RRR	RRR	RRR	RRR
Personal characteristics						
female	0.365***	0.155***	-	-	-	-
	(0.001)	(0.001)				
Education						
vocational[1]	1.970***	1.535***	2.092***	1.547***	1.913***	1.536***
	(0.011)	(0.013)	(0.016)	(0.020)	(0.018)	(0.017)
high_school_diploma[1]	2.433***	1.917***	2.999***	1.834***	1.963***	1.792***
	(0.008)	(0.009)	(0.014)	(0.015)	(0.010)	(0.011)
uni_education[1]	3.758***	4.027***	4.810***	4.455***	2.546***	2.982***
	(0.019)	(0.025)	(0.030)	(0.042)	(0.020)	(0.027)
other_training	1.612***	1.586***	1.702***	1.534***	1.497***	1.564***
	(0.009)	(0.011)	(0.012)	(0.017)	(0.014)	(0.016)
Household composition						
inactive_part[2]	1.082***	0.998	0.546***	0.515***	2.043***	1.683***
	(0.005)	(0.007)	(0.004)	(0.006)	(0.015)	(0.015)
unempl_part[2]	0.888***	0.669***	0.653***	0.536***	1.452***	0.941***
	(0.009)	(0.010)	(0.008)	(0.013)	(0.021)	(0.017)
employee_part[2]	1.192***	0.870***	0.816***	0.545***	2.957***	1.889***
	(0.005)	(0.005)	(0.004)	(0.005)	(0.022)	(0.016)
selfemployed_part[2]	0.891***	2.965***	0.638***	2.018***	2.450***	7.247***
	(0.005)	(0.024)	(0.004)	(0.019)	(0.034)	(0.101)
own_children	0.884***	0.988***	0.764***	0.826***	1.060***	1.203***
	(0.002)	(0.003)	(0.002)	(0.004)	(0.005)	(0.006)
IV						
reg_urate	0.943***	0.939***	0.941***	0.931***	0.943***	0.942***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Constant	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Other control variables[3]	included	included	included	included	included	included
Observations	3,247,778	3,247,778	1,672,248	1,672,248	1,575,530	1,575,530

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Omitted category of the dependent variable: not in the workforce. Reference categories: 1- Education: low education; 2- Partner's employment status: no cohabiting partner. 3- Other explanatory variables included: age, age squared, nationality, region of residence, quarter.

Table D.2 - OLS – 2nd stage of the Lee selection model. Dependent variable: (log) usual hours worked; sample = self-employed and employees

Sample	Self-employed			Employees		
Explanatory variables	All	Females	Males	All	Females	Males
female	-0.226***	-	-	-0.183***	-	-
	(0.005)			(0.001)		
Education						
vocational[1]	0.011***	-0.011*	0.017***	0.010***	0.020***	0.002**
	(0.003)	(0.006)	(0.003)	(0.001)	(0.003)	(0.001)
high_school_diploma[1]	0.004**	-0.033***	0.010***	0.009***	0.027***	-0.007***
	(0.002)	(0.004)	(0.002)	(0.001)	(0.003)	(0.001)
uni_education[1]	0.009***	-0.039***	-0.006*	-0.000	0.015***	-0.019***
	(0.003)	(0.008)	(0.003)	(0.001)	(0.003)	(0.001)
other_training	0.022***	0.016***	0.015***	0.027***	0.045***	0.007***
	(0.002)	(0.005)	(0.002)	(0.001)	(0.002)	(0.001)
Occupation						
freelance_prof (empl)[2]	0.151***	0.210***	0.121***	-	-	-
	(0.003)	(0.006)	(0.003)			
entrepreneur[2]	0.164***	0.181***	0.152***	-	-	-
	(0.003)	(0.009)	(0.003)			
small_business[2]	0.052***	0.080***	0.033***	-	-	-
	(0.003)	(0.006)	(0.003)			
small_business (empl) [2]	0.147***	0.196***	0.119***	-	-	-
	(0.003)	(0.006)	(0.003)			
family_business[2]	-0.091***	-0.092***	-0.038***	-	-	-
	(0.004)	(0.007)	(0.005)			
wcollar[3]	-	-	-	0.055***	0.093***	0.019***
				(0.001)	(0.001)	(0.001)
manager[3]	-	-	-	0.094***	0.112***	0.083***
				(0.001)	(0.002)	(0.001)
temporary	-	-	-	-0.077***	-0.092***	-0.065***
				(0.001)	(0.002)	(0.001)
Household composition						
inactive_part[4]	0.016***	-0.014**	0.033***	0.001	-0.065***	0.030***
	(0.002)	(0.007)	(0.002)	(0.001)	(0.002)	(0.001)
unempl_part[4]	0.000	0.009	0.021***	-0.029***	-0.090***	0.021***
	(0.005)	(0.013)	(0.005)	(0.002)	(0.004)	(0.002)
employee_part[4]	0.011***	-0.024***	0.045***	-0.028***	-0.064***	0.014***
	(0.002)	(0.006)	(0.002)	(0.001)	(0.001)	(0.001)
selfemployed_part[4]	0.051***	-0.052***	0.047***	-0.053***	-0.086***	0.025***
	(0.005)	(0.009)	(0.006)	(0.001)	(0.002)	(0.002)
own_children	-0.018***	-0.071***	-0.002**	-0.020***	-0.058***	0.002***
	(0.001)	(0.002)	(0.001)	(0.000)	(0.001)	(0.000)
Lambda1 (self-emp)	-0.011***	0.005	0.010***	-	-	-
	(0.002)	(0.003)	(0.002)			
Lambda2 (emp)	-	-	-	-0.002**	-0.001	0.003***
				(0.001)	(0.001)	(0.001)
Constant	2.849***	3.024***	3.288***	3.368***	3.267***	3.420***
	(0.034)	(0.086)	(0.038)	(0.012)	(0.027)	(0.012)
Other control variables[5]	included	included	included	included	included	included
Observations	390,947	118,614	272,333	1,308,460	605,001	703,459
R-squared	0.148	0.123	0.120	0.186	0.106	0.097

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Education: low education; 2- Self-employed occupation: freelancer; 3- Employee occupation: Blue-collar and apprenticeship; 4- Partner's employment status: no cohabiting partner. 5- Other explanatory variables included: age, age squared, nationality, education, region of residence, sector of employment, job tenure, year.

Table D.3 - Ordered probit model. Dependent variable: hours satisfaction (1-10); coefficients. sample = self-employed and employees

Sample	Self-employed			Employees		
	All	Females	Males	All	Females	Males
Explanatory variables	(coeff)	(coeff)	(coeff)	(coeff)	(coeff)	(coeff)
female	0.079***	-	-	-0.023***	-	-
	(0.010)			(0.005)		
Occupation						
freelance_prof (empl)[1]	0.133***	0.162***	0.095***	-	-	-
	(0.023)	(0.042)	(0.027)			
entrepreneur[1]	0.352***	0.534***	0.255***	-	-	-
	(0.025)	(0.050)	(0.029)			
small_business[1]	-0.107***	0.017	-0.158***	-	-	-
	(0.015)	(0.028)	(0.018)			
small_business (empl)[1]	0.139***	0.250***	0.075***	-	-	-
	(0.017)	(0.031)	(0.020)			
family_business[1]	0.354***	0.454***	0.156***	-	-	-
	(0.023)	(0.035)	(0.032)			
wcollar[2]	-	-	-	0.350***	0.400***	0.267***
				(0.006)	(0.009)	(0.009)
manager[2]	-	-	-	0.394***	0.401***	0.382***
				(0.010)	(0.015)	(0.014)
temporary	-	-	-	-0.161***	-0.145***	-0.141***
				(0.008)	(0.011)	(0.011)
Hours of work[3]						
16-30	0.913***	0.835***	1.083***	1.510***	1.553***	1.134***
	(0.033)	(0.041)	(0.048)	(0.017)	(0.019)	(0.039)
31-45	1.318***	0.787***	1.969***	1.822***	1.590***	2.285***
	(0.031)	(0.039)	(0.046)	(0.017)	(0.019)	(0.038)
46+	0.907***	0.267***	1.583***	1.074***	0.917***	1.464***
	(0.032)	(0.041)	(0.046)	(0.020)	(0.027)	(0.040)
Household composition						
inactive_part[4]	0.049***	-0.032	0.057***	0.065***	0.016	0.063***
	(0.014)	(0.030)	(0.016)	(0.008)	(0.013)	(0.010)
unempl_part[4]	-0.161***	-0.163***	-0.158***	-0.067***	-0.125***	-0.042**
	(0.029)	(0.057)	(0.033)	(0.014)	(0.021)	(0.018)
employee_part[4]	0.115***	0.105***	0.101***	0.066***	0.088***	0.014
	(0.013)	(0.022)	(0.016)	(0.007)	(0.008)	(0.009)
selfemployed_part[4]	0.109***	0.070***	0.066***	0.125***	0.118***	0.012
	(0.015)	(0.021)	(0.018)	(0.010)	(0.012)	(0.018)
own_children	0.063***	0.096***	0.033***	0.085***	0.130***	0.034***
	(0.006)	(0.011)	(0.007)	(0.004)	(0.005)	(0.005)
Other control variables[5]	included	included	included	included	included	included
Observations	188,741	59,317	129,424	643,996	303,964	340,032

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Self-employed occupation: freelancer; 2- Employee occupation: Blue-collar and apprenticeship; 3- hours of work; 4- Partner's employment status: no cohabiting partner; 5- Other explanatory variables included: age, age squared, nationality, education, region of residence, sector of employment, job tenure, year.

Table D.4 - Ordered probit model. Dependent variable: hours satisfaction (1-10); marginal effects. Sample = self-employed individuals

Sample	All		Females		Males	
Explanatory variables	Pr(y=0)	Pr(y=10)	Pr(y=0)	Pr(y=10)	Pr(y=0)	Pr(y=10)
female	-0.001***	0.003***	-	-	-	-
	(0.000)	(0.000)				
Occupation						
freelance_prof (empl)[1]	-0.002***	0.006***	-0.003***	0.008***	-0.002***	0.004***
	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)
entrepreneur[1]	-0.006***	0.017***	-0.007***	0.032***	-0.004***	0.010***
	(0.000)	(0.001)	(0.001)	(0.004)	(0.000)	(0.001)
small_business[1]	0.002***	-0.004***	-0.000	0.001	0.003***	-0.006***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
small_business (empl)[1]	-0.002***	0.006***	-0.004***	0.013***	-0.001***	0.003***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.001)
family_business[1]	-0.006***	0.017***	-0.007***	0.026***	-0.003***	0.006***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
Hours worked[2]						
16-30	-0.012***	0.052***	-0.011***	0.051***	-0.013***	0.062***
	(0.000)	(0.002)	(0.001)	(0.003)	(0.000)	(0.004)
31-45	-0.024***	0.061***	-0.013***	0.041***	-0.038***	0.088***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)
46+	-0.015***	0.042***	-0.004***	0.014***	-0.028***	0.069***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)
Household composition						
inactive_part[3]	-0.001***	0.002***	0.001	-0.002	-0.001***	0.002***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
unempl_part[3]	0.003***	-0.006***	0.003***	-0.007***	0.003***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
employee_part[3]	-0.002***	0.005***	-0.002***	0.005***	-0.002***	0.004***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
selfemployed_part[3]	-0.002***	0.005***	-0.001***	0.003***	-0.001***	0.002***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
own_children	-0.001***	0.003***	-0.002***	0.005***	-0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Other control variables[4]	included	included	included	included	included	included
Observations	188,741	188,741	59,317	59,317	129,424	129,424

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Self-employed occupation: freelancer; 2- hours of work; 3- Partner's employment status: no cohabiting partner; 4- Other explanatory variables included: age, age squared, nationality, education, region of residence, sector of employment, job tenure, year.

Table D.5 - Ordered probit model. Dependent variable: job satisfaction (1-10); marginal effects. Sample = employees

	all		females		males	
Explanatory variables	Pr(y=0)	Pr(y=10)	Pr(y=0)	Pr(y=10)	Pr(y=0)	Pr(y=10)
female	0.000***	-0.002***	-	-	-	-
	(0.000)	(0.000)				
Occupation						
wcollar[1]	-0.003***	0.025***	-0.003***	0.029***	-0.002***	0.018***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
manager[1]	-0.003***	0.031***	-0.003***	0.034***	-0.002***	0.028***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
temporary	0.001***	-0.011***	0.001***	-0.010***	0.001***	-0.009***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Hours worked[2]						
16-30	-0.008***	0.153***	-0.011***	0.140***	-0.005***	0.109***
	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)	(0.005)
31-45	-0.022***	0.101***	-0.015***	0.115***	-0.042***	0.087***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)
46+	-0.005***	0.112***	-0.005***	0.096***	-0.006***	0.162***
	(0.000)	(0.003)	(0.000)	(0.004)	(0.000)	(0.007)
Household composition						
inactive_part[3]	-0.000***	0.005***	-0.000	0.001	-0.000***	0.004***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
unempl_part[3]	0.001***	-0.005***	0.001***	-0.009***	0.000**	-0.003**
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
employee_part[3]	-0.001***	0.005***	-0.001***	0.006***	-0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
selfemployed_part[3]	-0.001***	0.009***	-0.001***	0.009***	-0.000	0.001
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
own_children	-0.001***	0.006***	-0.001***	0.009***	-0.000***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Other control variables[5]	included	included	included	included	included	included
Observations	643,996	643,996	303,964	303,964	340,032	340,032

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

NOTES: Reference categories: 1- Employee occupation: Blue-collar and apprenticeship; 2- hours of work; 3- Partner's employment status: no cohabiting partner; 4- Other explanatory variables included: age, age squared, nationality, education, region of residence, sector of employment, job tenure, year.

Appendix E: Self-Employment in Italy

In this appendix, we provide definitions for self-employment and the different categories of self-employment used by the Istat and explain why it is important to distinguish among these categories when analysing self-employment in Italy.

The definition of self-employment given in the Italian civil code is based on the economic status of the self-employed as non-dependent workers (article 2222 of civil code)[81]. Accordingly, *'Istat defines a self-employed worker by the legal status of his/her work – that is, by the rules that regulate the employment relationship – so that s/he is characterized as self-employed when "no employment relationship is established and the work is performed as part of an activity whose proprietor is the worker him/herself or a member of his/her family'* (Rosti and Chelli, 2005, p.133).

The Istat also classifies self-employed workers into five sub-categories categories of self-employment, namely: entrepreneurs, small business owners, freelance professionals, members of production cooperatives, and family workers. This classification reflects the fact that the Italian Law distinguishes between different sub-categories of self-employment based on the type of profession, and the fact that the aforementioned sub-categories are subjected to different tax and pension rules.

First, the civil code makes a clear distinction between entrepreneurs and other self-employed workers, stressing the managerial nature of entrepreneurship compared to other non-dependent workers[82]. The civil code also defines small business owners as a specific

[81] An accurate translation of the definition of self-employment for the Italian civil code is offered by Rosti and Chelli (2005, p.133). They explain that '*…the feature shared by self-employers and other-employers is their economic status as non-dependent workers.'*

[82] The Italian civil code provides the following definitions of entrepreneur and self-employed worker. The entrepreneur is defined as an individual who conducts an organized economic activity professionally, with the aim of producing or trading goods or services (article 2082 of the civil code). The self-employed worker is a person committed to performing work or a service, mainly with his/her own work and with no employment relationship towards the client (article 2022 of the civil code).

subcategory of entrepreneurs, based on the criteria that are described in the article 2083 of the civil code[83]. According to these criteria, small business enterprises do not only differ in terms of size, but also in terms of the legal requirements they need to meet. In fact, while 'normal' entrepreneurs are legally required to keep accounting books and are subject to strict rules regarding financial bankruptcy, small business owners are exempt from these obligations. This translates into reduced start-up costs (or competences needed to start a new businesses) and lower entrepreneurial risk for small business owners.

Professional freelancers are defined as those self-employed workers in intellectual professions such as IT consultants, lawyers, medical doctors, pharmacists, engineers, wedding planners, etc. (article 229 of the civil code)[84]. These are not subjected to bankruptcy rules as in the case of small entrepreneurs and may have the possibility to access specific social security funds (*Casse di previdenza e assistenza per i liberi professionisti*) which offer generous social security schemes to their members. This may be an important incentive to enter self-employment. In fact, existing studies have shown that the presence of similar incentives such as the possibility of having health insurance are positively associated with an individual's likelihood of being self-employed (Wellington, 2001)[85].

In this chapter, we use the definitions of the different categories of self-employment provided by Istat (namely entrepreneurs, small business owners, freelance professionals, members of production cooperatives, and family workers).

[83] Examples of small business owners are artisans, retailers, shopkeepers, and small farm owners.
[84] According to the civil code, these may also include the so-called project workers (in Italian, *contratti a progetto*) but these are classified by Istat by a separate variable and not considered in the present study for the reasons explained in Section 3.3.1.
[85] In this section, we do not discuss the definition of cooperative members as they are not considered in this study.

CHAPTER 5: CONCLUSION

This thesis has presented three related, yet independent, empirical chapters, each exploring important topics in the areas of female labour force participation and other labour market outcomes among females, using individual-level data from Italy. Specifically, Chapter 2 has estimated the determinants of reservation wages among unemployed women. Chapter 3 has investigated the effect of domestic work on female LFP, and the relationship between child care and measures of occupational attainment and job quality of mothers. Chapter 4 has explored the determinants of female self-employment and different types of self-employment among Italian women, and the determinants of hours worked and satisfaction with hours worked by self-employed women.

5.1 Thesis Summary

5.1.1 Summary of Chapter 2

Chapter 2 has investigated the determinants of the reservation wages of unemployed women and the determinants of the reservation wage gap between unemployed women and men, using data drawn from Italian the Labour Force Survey (LFS).

This chapter has contributed to the existing literature in several ways. First, it has explored the relationship between reservation wages and the presence of co-resident adults. Second, it has examined whether job preferences play a role in explaining differences in reservation wages between unemployed females and males. Third, it has used quantile regression and the decomposition method of differences in the reservation wage distribution, to explore whether unobserved factors potentially related to female occupational segregation and perceived wage discrimination affect the reservation wage gap at different points of the distribution.

The results in this chapter have shown that the presence of adult relatives is negatively related to the reservation wages of females but unrelated to the reservation wages of males. 12% of the gender reservation wage gap in Italy was explained by different job preferences between unemployed females and unemployed males. In addition, the decomposition analysis has shown that the gender reservation wage gap is not constant over the distribution but larger at its lower end. This was due to residual factors which are likely to be associated with perceived discrimination and occupational segregation of women into low paid jobs.

5.1.2 Summary of Chapter 3

Chapter 3 has used the Italian Sample Survey on Births to investigate the effect of childcare and housework on female LFP. It has also analysed the relationship between child care and a wide range of different labour market outcomes, such as occupational attainment, the number of hours worked, the type of contract (part-time versus full-time, and temporary versus permanent employment), and sector of employment (private sector versus public sector employment).

This study has contributed to the existing literature in the following ways. First, it has used detailed household-level measures of the father's childcare engagement and housework, which have not been used in previous studies and are consistent with Becker's (1965) framework of an individual's time allocation. Second, it has examined the relationship between childcare and the occupational attainment of mothers. Third, it has analysed the relationship between childcare and different job attributes (hours worked, type of contract and sector of employment) that potentially capture job quality.

The findings suggest that the mother's probability of entering the labour market is positively associated with the partner's engagement with childcare. In fact, mothers whose partners have the highest level of childcare engagement were 20 percentage points more

likely to be employed. In addition, the use of paid childcare options (nursery or baby-sitters) was found to be positively associated with being employed in managerial positions, but negatively related to temporary and part-time employment.

5.1.3 Summary of Chapter 4

This chapter has used the Italian LFS to investigate the determinants of self-employment, and different types of self-employment, among females. In addition, it has examined the determinants of hours worked and satisfaction with respect to hours worked for self-employed women.

The contribution of this chapter to the literature has been manifold. First, it has focused on self-employed females in Italy, which has not received a great deal of attention in the literature. Second, it has explored the determinants of different types of self-employment, which allowed for a comprehensive analysis of female self-employment. Third, it has examined the determinants of hours worked by the self-employed, which has received little attention due to a shortage of data. Finally, it has analysed the determinants of satisfaction with respect to the working hours of self-employed individuals.

Our findings have shown little difference in the determinants of self-employment between females and males. However, women were less likely to work in categories that involve management of other employees, which require longer hours of work. In addition, we have found that the association between having children and the probability of being a family worker was negative for men but positive for women, reflecting that women with children might prefer the flexibility offered by this work arrangement.

We have also found evidence of different determinants of hours supplied between self-employed men and self-employed women. Controls for household members were inversely associated with the hours worked by self-employed women but positively related

to the hours supplied by self-employed men. Finally, self-employed women – especially those with children – are more satisfied when they work shorter hours. Social norms such as the unbalanced division of household labour may have a negative impact on the careers of self-employed females.

5.2 Policy Implications and Areas for Future Research

In this section, we discuss the policy implications of our findings and recommend some important areas for future research[86].

In Chapter 2, we have found that willingness to commute and to accept a temporary contract accounted for 12% of the gender reservation wage gap in Italy. This suggests that preferences for non-wage attributes may partly explain different employment rates between men and women. Hence, investigating employment preferences of unemployed women may serve to facilitate their entry into the labour market. In particular, future research should focus on designing survey questions to elicit detailed information on the preferences of unemployed individuals with respect to other non-wage attributes such as the possibility of working with flexible hours. Our analysis has also suggested that occupational segregation and wage discrimination may play an important role in explaining the low employment rate of Italian women. Women located at the lower part of the reservation wage distribution share certain characteristics (such as having, on average, low education, being more likely to live in poor areas and have no previous work experience), which may make them more likely to suffer labour market discrimination. Policies aimed at increasing the employment rates of females should pay particular attention to those women that are more likely to suffer from (or perceive) discrimination. Investing in subsidised childcare and care for the elderly are examples of policies that have helped North European countries such as Denmark, Finland,

[86] Since all of the results presented in this chapter represent associations rather than causal relationships, policy implications are given bearing this in mind.

Iceland, Norway and Sweden to close the gap in the employment rates between males and females, in the last decades (OECD, 2018b). Explaining the suitability of such policies in Italy is an interesting area for future research.

The findings from Chapter 3 have suggested that household composition plays an important role in explaining the relatively weak performance of Italian women in many aspects of their career. Women with children younger than three were less likely to be employed, had a lower probability of working as managers, and were also less likely to be employed in permanent positions. In contrast, the availability of formal childcare options (public or private nursery schools) was positively related to these labour market outcomes. In a context where social norms lead to a specialisation of women in domestic work, policy-makers should be aware that in order to reduce the gender gaps in the labour market, providing access to affordable and universally accessible pre-school for young children may help to reconcile family and work. Furthermore, the adoption of family-friendly policies may also have positive effects on social norms and incentivise a better gender balance in unpaid and paid work. For example, in Germany a number of reforms have been introduced in the mid-2000s to move away from the traditional male-breadwinner model, by increasing public investments in childcare and providing strong financial incentives to fathers to take paid parental leave for at least 2 months after childbirth (OECD, 2017b). The adoption of such policies has led Germany today to display highly egalitarian attitudes towards sharing of parental leave between parents (OECD, 2017b). The introduction of similar policies might be particularly beneficial for Italy, where social norms have led to a more frequent specialization of women in unpaid work, compared to most of the other OECD countries.

The findings in Chapter 4 suggested that mothers working as employees are less satisfied than those without children when they work full-time hours, relative to working

part-time. In Italy, a country characterized by a lack of affordable childcare and time-flexible jobs, self-employment is an occupational strategy that can be used by women to reconcile family responsibilities with their career. In addition, employed and self-employed mothers work fewer hours than those who do not have children. Policy-makers and employers should make it possible for women to opt for more flexible and family-friendly working hours, as the introduction of such family-friendly policies may have benefits on the entire Italian economy.

While self-employment has usually being treated as a single category, we have shown that analysis of the different types of self-employment is important because these categories differ in terms of levels of education, hours worked (potentially capturing required competences and work effort, respectively), and satisfaction with respect to working hours. In addition, self-employment categories may also differ with respect to factors such as time constraints, start-up capital, exposure to uncertainty, and managerial abilities; such information is rarely available from labour market surveys at this level of detail. Hence, future research should help to design survey questions to better elicit information on the different types of self-employment.

Finally, this thesis has used cross-sectional data to explore different research questions in the area of labour economics. However, the availability of panel data would be valuable to help to control for unobserved factors that can potentially affect the estimates of the determinants of different labour market outcomes. It is apparent that for future research in this area addressing the current unavailability of individual panel data would be an important move in the right direction.

References

Addabbo, T., and Favaro, D. (2011). Gender Wage Differentials by Education in Italy. *Applied Economics*, Vol.43 (29), 4589-4605.

Adams, R., and Ferreira, D. (2009). Women in the Boardroom and Their Impact on Governance and Performance. *Journal of Financial Economics*, Vol. 94 (2), 291-309.

Addison, J., Centeno, M., and Portugal, P. (2010). Unemployment Benefits and Reservation Wages: Key Elasticities from a Stripped-Down Job Search Approach. *Economica*, Vol. 77 (305), 46–59.

Ajayi-obe, O., and Parker, S. (2005). The Changing Nature of Work among the Self-Employed in the 1990s: Evidence from Britain. *Journal of Labor Research*, Vol. 26 (3), 501-517.

Allen, W. and Curington, W. (2014). The Self-Employment of Men and Women: What are Their Motivations?. *Journal of Labor Research*, Vol. 35 (2), 143-161.

Andrén, T. (2003). The Choice of Paid Childcare, Welfare, and Labor Supply of Single Mothers. *Labour Economics*, Vol. 10 (2), 133-147.

Angrist, J., and Evans, W. (1998). Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size. *The American Economic Review*, Vol. 88 (3), 450-477.

Angrist, J., and Pischke, J. (2009). *Mostly Harmless Econometrics: an Empiricist's Companion*. Oxford: Princeton University Press.

Apps, P., and Rees, R. (2003). Gender, Time Use and Models of the Household. *IZA Discussion Paper* No. 796.

Apps, P., and Rees, R. (2005). Time Use and Public Policy Over the Life Cycle. *Oxford Review of Economic Policy*, Vol. 21 (3), 439-461.

Arai, A. (2000). Self-Employment as a Response to the Double Day. *Canadian Review of Sociology and Anthropology*, Vol. 37 (2), 125-42.

Averett, S., Peters, E., and Waldman, D. (1997). Tax Credits, Labor Supply, and Child Care. *The Review of Economics and Statistics*, Vol. 79 (1), 125-135.

Barbieri, G., and Sestito, P. (2008). Temporary Workers in Italy: Who Are They and Where They End Up. *LABOUR*, Vol. 22 (1), 127-166.

Barth, E., and Dale-Olsen, H. (2009). Monopsonistic Discrimination, Worker Turnover, and the Gender Wage Gap. *Labour Economics*, Vol. 16 (5), 589-97.

Beblo, M., and Robledo, J. (2008). The Wage Gap and the Leisure Gap for Double-Earner Couples. *Journal of Population Economics*, Vol. 21 (2), 281-304.

Becker, G. (1965). A Theory of Allocation of Time. *The Economic Journal*, Vol. 75 (299), 49-517.

Berardo, D., Shehan, C., and Leslie, G. (1987). A Residue of Tradition: Jobs, Careers, and Spouses' Time in Housework. *Journal of Marriage and Family*, Vol. 49 (2), 381-390.

Blackaby, D., Latreille, P., Murphy, P., O'Leary, N., and Sloane, P. (2007). An Analysis of Reservation Wages for the Economically Inactive. *Economics Letters*, Vol. 97 (1), 1-5.

Blanchflower, D. (2000). Self-Employment in OECD Countries. *Labour Economics*, Vol. 7 (5), 471-505.

Blank, R. (1985). An Analysis of Workers' Choice Between Employment in the Public and Private Sectors. *Industrial and Labor Relations Review*, Vol. 38 (2), 211-224.

Blau, D., and Hagy, A. (1998). The Demand for Quality in Child Care. *Journal of Political Economy*, Vol. 106 (1), 104-146.

Blau, D., and Robins, P. (1991). Child Care Demand and Labor Supply of Young Mothers over Time. *Demography*, Vol. 28 (3), 333-351.

Blau, F., and Kahn, L. (2007). Changes in the Labor Supply Behavior of Married Women. *Journal of Labor Economics*, Vol. 25 (3), 393-438.

Blau, F., and Kahn. L. (1992). The Gender Earnings Gap: Learning from International Comparisons. *American Economic Review*, Vol. 82 (2), 533-38.

Blau, F., and Kahn. L. (2006). The U.S. Gender Pay Gap in the 1990S: Slowing Convergence. *Industrial and Labor Relations Review*, Vol. 60 (1), 45-66.

Bloemen, H., Pasqua, S., and Stancanelli, E. (2010). An Empirical Analysis of the Time Allocation of Italian Couples: Are They Responsive?. *Review of Economics of the Household*, Vol. 8 (3), 345–369.

Blundell, R. and MaCurdy, T. (1999). Labour Supply: a Review of Alternative Approaches. In: Ashenfelter, O., and Card, D. *Handbook of Labour Economics*, Vol. 3A, Amsterdam: Elsevier, 1559-1695.

Blundell, R., Ham, J., and Meghir, C. (1987). Unemployment and Female Labour Supply. *The Economic Journal*, Vol. 97, 44-64.

Boden, R. (1999). Flexible Working Hours, Family Responsibilities and Female Self-Employment, *American Journal of Economics & Sociology*, Vol. 58 (1), 71-83.

Bognetti, G., and Obermann, G. (2008). Liberalization and Privatization of Public Utilities: Origins of the Debate, Current Issues and Challenges for the Future. *Annals of Public and Cooperative Economics*, Vol. 79 (3-4), 461-485.

Bond, S. and Sales, J. (2001). Household Work in the UK: a Household Analysis of the BHPS 1994. *Work, Employment & Society*, Vol. 15 (2), 233-50.

Booth, A., and Van Ours, J. (2007). Hours of Work and Gender Identity: Does Part-time Work Make the Family Happier?. *Economica*, Vol. 76 (301), 176-196.

Booth, A., and Van Ours, J. (2008). Job Satisfaction and Family Happiness: The Part-Time Work Puzzle. *Economic Journal*, Vol. 118 (526), 77-99.

Bratti, M., Del Bono, E., and Vuri, D. (2005). New Mothers' Labour Force Participation in Italy: The Role of Job Characteristics. *LABOUR*, Vol. 19 (Special issue), 79-121.

Bredemeier, C., and Juessen, F. (2013). Assortative Mating and Female Labor Supply. *Journal of Labor Economics*, Vol. 31 (3), 603-631.

Bredtmann, J. (2014). The Intra-Household Division of Labor: An Empirical Analysis of Spousal Influences on Individual Time Allocation. *LABOUR*, Vol. 28 (1), 1-39.

Brown, R., Moon, M., and Zoloth, B. (1980). Occupational Attainment and Segregation by Sex. *Industrial and Labor Relations Review*, Vol. 33 (4), 506-517.

Brown, S., and Sessions, J. (1999). Education and Employment Status: A Test of the Strong Screening Hypothesis in Italy. *Economics of Education Review*, Vol. 18 (4), 397-404.

Brown, S., and Taylor, K. (2013). Reservation Wages, Expected Wages and Unemployment. *Economic Letters*. Vol. 119 (3), 276-279.

Brown, S., and Taylor, K. (2015). The Reservation Wage Curve: Evidence from the U.K.. *Economics Letters*, Vol. 126 (C), 22-24.

Brown, S., Roberts, J., and Taylor, K. (2010). Reservation Wages, Labour Market Participation and Health. *Journal of the Royal Statistical Society*, Vol. 173 (3), 501-529.

Brown, S., Roberts, J., and Taylor, K. (2011). The Gender Reservation Wage Gap: Evidence form British Panel Data. *Economics Letters*, Vol. 113 (1), 88-91.

Brunello, G. (2000). The Returns to Education in Italy: A New Look at the Evidence. *IZA Discussion Paper* No. 130.

Byrnes, J., Miller, D., and Schafer, W. (1999). Gender Differences in Risk Taking: A Meta-Analysis. *Psychological Bulletin*, Vol. 125 (3), 367-383.

Caliendo, M., Lee, W., and Mahlstedt, R. (2017). The Gender Wage Gap and the Role of Reservation Wages: New Evidence for Unemployed Workers. *Journal of Economic Behavior and Organization*, Vol. 136, 161-173.

Cai, L., and Law, V. (2014). Is Part-time Employment a Stepping Stone to Full-time Employment?. *Economic Record*, Vol. 90 (291), 462-485.

Camerer, C., Babcock, L., Loewenstein, G. and Thaler, R. (1997). Labour Supply of New York City Cabdrivers: One Day at a Time, *Quarterly Journal of Economics*, Vol. 112 (2), 407-441.

Campa, P., Casarico, A., and Profeta, P. (2010). Gender Culture and Gender Gap in Employment. *CESifo Economic Studies*, Vol. 57 (1), 156-182.

Caputo, R., and Dolinsky, A. (1998). Women's Choice to Pursue Self-Employment: the Role of Financial and Human Capital of Household Members. *Journal of Small Business Management*, Vol. 36 (3), 8-17.

Carr, D. (1996). Two Paths to Self-Employment? Women's and Men's Self-Employment in the United States, *Work and Occupations*, Vol. 23 (1), 26-53.

Casarico, A., and Profeta, P. (2009), Uguaglianza di Genere e Sistemi Pensionistici: Aspetti Critici e Prospettive per l'Italia. *Studi e Note di Economia*, Vol. 14 (3), 491-513.

Casarico, A., and Profeta, P. (2010), *Donne in Attesa*, Egea: Milano.

Chen, X., Ender, P., Mitchell, M., and Wells, C. (2003). Regression with Stata, UCLA, available at https://stats.idre.ucla.edu/stat/stata/webbooks/reg/default.htm.

Chiappori, P. (1988). Rational Household Labor Supply. *Econometrica*, Vol. 56 (1). 63-90.

Chiappori, P. (1992). Collective Labor Supply and Welfare. *Journal of Political Economy*, Vol. 100 (3), 43-47

Chiuri, M. (2000). Quality and Demand of Child Care and Female Labour Supply in Italy. *LABOUR*, Vol. 14 (1), 97-118.

Christofides L., and Pashardes, P. (2002). Self/Paid-Employment, Public/Private Sector Selection and Wage Differentials. *Labour Economics*, Vol. 9 (6), 737-762.

Clain, S. (2000). Gender Differences in Full-Time Self-Employment. *Journal of Economics and Business*. Vol. 52 (6), 499-513.

Clark, A. (1997). Job Satisfaction and Gender: Why are Women so Happy at Work?. *Labour Economics*, Vol. 4 (4), 341-372.

Clark, A., and Postel-Vinay, F. (2009). Job Security and Job Protection. *Oxford Economic Papers*, Vol. 61 (2), 207-239.

Coen-Pirani, D., León, A., and Lugauer, S. (2010). The Effect of Household Appliances on Female Labor Force Participation: Evidence from Microdata. *Labour Economics*, Vol. 17 (3), 503-513.

Colombino, U., and Del Boca, D. (1990). The Effect of Taxes on Labor Supply in Italy. *Journal of Human Resources*, Vol. 25 (Summer 90), 390-414.

Colombino, U., and Di Tommaso, M. (2000). Identifying Demand and Supply of Part-time Jobs Using Personnel Data. An Application to Italy. *LABOUR*, Vol. 14 (4), 609-622.

Connelly, R. (1992a). The Effect of Child Care Costs on Married Women's Labor Force Participation. *The Review of Economics and Statistics*, Vol. 74 (1), 83-90.

Connelly, R. (1992b). Self-Employment and Providing Child Care. *Demography*, Vol. 29 (1), 17-29.

Connelly, R., and Kimmel, J. (2005). Marital Status and Full-time/Part-time Work Status in Child Care Choices. *Applied Economics*, Vol. 35 (7), 761-777.

Cooksey, E., Joshi, H., and Verropoulou, G. (2009). Does Mothers' Employment Affect Children's Development? Evidence from the children of the British 1970 Birth Cohort and the American NLSY79. *Longitudinal and Life Course Studies: International Journal*, Vol. 1 (1), 95-115.

Craig, L., Powell, A., and Cortis, N. (2012). Self-Employment, Work-Family Time and the Gender Division of Labour. *Work, Employment & Society*, Vol. 26 (5), 716-734.

Currie, J., and Blau, D. (2004). Preschool, Day Care, and After School Care: Who's Minding the Kids?. In: Hanushek, E., and Welch, F., *Handbook of the Economics of Education*, Vol. 2, Elsevier: Amsterdam, 1163-1278.

Dawson, C., Henley, A., and Latrielle, P. (2009). Why Do Individuals Choose Self-Employment?, *IZA Discussion Paper* No. 3974.

Daymont, T. and Andrisani, P. (1984). Job Preferences, College Major, and the Gender Gap in Earnings. *The Journal of Human Resources*, Vol. 19 (3), 408-428.

de la Rica, S., Dolado, J., and Llorens, V. (2008). Ceilings or floors? Gender Wage Gaps by Education in Spain. *Journal of Population Economics*, Vol. 21 (3), 777-778.

de V. Cavalcanti, T., and Tavares, J. (2008). Assessing the "Engines of Liberation": Home Appliances and Female Labor Force Participation. *The Review of Economics and Statistics*, Vol. 90 (1), 81-88.

de Ven, W., and Praag, B., (1981). The Demand for Deductibles in Private Health Insurance: a Probit Model with Sample Selection. *Journal of Econometrics*, Vol. 17 (2), 229-252.

Del Boca, D. (2002). The Effect of Child Care and Part Time Opportunities on Participation and Fertility Decisions in Italy. *Journal of Population Economics*, Vol. 5 (3), 549-573.

Del Boca, D., and Locatelli, M. (2006). The Determinants of Motherhood and Work Status: A Survey. *IZA Discussion Paper* No. 2414.

Del Boca, D., and Vuri, D. (2007). The Mismatch Between Employment and Child Care in Italy: The Impact of Rationing. *Journal of Population Economics*, Vol. 20 (4), 805-832.

Del Boca, D., Locatelli, M., and Vuri, D. (2004). Child Care Choices by Italian Households. *IZA Discussion Paper* No. 983.

Del Bono, E., and Vuri, D. (2011). Job Mobility and the Gender Wage Gap in Italy. *Labour Economics*, Vol. 18 (1), 130-142.

Díaz, M., and Sánchez, R. (2008). Temporary Contracts and Young Women in Spain. *Applied Economics*, Vol. 40 (11), 1435-1442.

Dolado, J., Felgueroso, F., and Jimeno, J. (2004). Where Do Women Work? Analyzing Patterns in Occupational Segregation by Gender. *Annals of Economics and Statistics*, Vol. 71-72, 293-315.

Dubin, J., and McFadden, D. (1984). An Econometric Analysis of Residential Electric Appliance Holdings and Consumption. *Econometrica*, Vol. 52 (2), 345-362.

Duvander, A., and Sundstrom, M. (2002). Gender Division of Childcare and the Sharing of Parental Leave Among New Parents. *European Sociological Review*, Vol. 18 (4), 433-447.

Eckel, C., and Grossman, P. (2002). Sex Differences and Statistical Stereotyping in Attitudes Toward Financial Risks. *Evolution and Human Behavior*, Vol. 23 (4), 281-295.

Eckel, C., and Grossman, P. (2008). Men, Women and Risk Aversion: Experimental Evidence, In: *Handbook of Experimental Economics Results*, Vol. 1, 1061-1073.

Eichhorst, W., Marx, P., and Tobsch, V. (2013). Non-Standard Employment across Occupations in Germany: The Role of Replaceability and Labour Market Flexibility. *IZA Discussion Paper* No. 7662.

European Commission (2007). Women and Men in Decision-Making. Analysis of the Situation and Trends, available at: http://ec.europa.eu.

European Commission, (2016). Strategic Engagement for Gender Equality 2016-2019, Luxembourg: Publications Office of the European Union, available at: http://ec.europa.eu/justice/gender-equality/document/files/strategic_engagement_en.pdf.

Euwals, R., and van Soest, A. (1999). Desired and Actual Labour Supply of Unmarried Men and Women in the Netherlands. *Labour Economics*, Vol. 6 (1), 95-118.

Feinberg, R. (1987). An Empirical Investigation of Owner-Manager Labour-Supply Behaviour, *Managerial & Decision Economics*, Vol. 8 (3), 213-216.

Feldstein, M., and Poterba, J. (1984). Unemployment Insurance and Reservation Wages. *Journal of Public Economics*, Vol. 23 (1), 141-167.

Ferrera, M. (2008). *Il Fattore D*, Mondadori: Milano.

Ferrer-i-Carbonell, A. and Frijters, P. (2004). How Important is Methodology for the Estimates of the Determinants of Happiness?. *Economic Journal*, Vol. 114 (497), 641-59.

Gagliarducci, S. (2005). The Dynamics of Repeated Temporary Jobs. *Labour Economics*, Vol. 12 (4), 429-448.

Gelbach, J. (2002). Public Schooling for Young Children and Maternal Labor Supply. *The American Economic Review*, Vol. 92 (1), 307-322.

Georgellis, Y., and Wall, H. (2005). Gender Differences in Self-Employment. *International Review of Applied Economics*, Vol. 19 (3), 321-342.

Gravelle, H. (2004). *Microeconomics, 3rd ed*. Harlow: Financial Times/Prentice Hall.

Gronau, R. (1971). Information and Frictional Unemployment. *The American Economic Review*, Vol. 61 (3), 290-301.

Gronau, R. (1977). Leisure, Home Production, and Work. The Theory of the Allocation of Time Revisited. *Journal of Political Economy*, Vol. 85 (6), 1099-1123.

Grund, C. (2013). Job Preferences as Revealed by Employee-Initiated Job Changes. *The International Journal of Human Resource Management*, Vol. 24 (15), 2825-2850.

Güell, M., and Petrongolo, B. (2007). How Binding Are Legal Limits? Transitions from Temporary to Permanent Work in Spain. *Labour Economics*, Vol. 14 (2), 153-183.

Ham, J. (1982). Estimation of a Labour Supply Model with Censoring Due to Unemployment and Underemployment. *The Review of Economic Studies*, Vol. 49 (3), 335-354.

Hallberg, D., and Klevmarken, A. (2003). Time for Children: A Study of Parent's Time Allocation. *Journal of Population Economics*, Vol. 16 (2), 205-226.

Hang-Yue, N. (2002). Part-time Employment in Hong Kong: a Gendered Phenomenon? *The International Journal of Human Resource Management*, Vol. 13 (2), 361-377.

Harkness, S., and Waldfogel, J. (2003) The Family Gap in Pay: Evidence from Seven Industrialized Countries. *Research in Labor Economics*, Vol. 22, 369-414.

Harmonized European Time Use Survey (HETUS), available online: https://www.h5.scb.se/tus/tus/Statistics.html.

Haurin, D., and Sridhar, K. (2003). The Impact of Local Unemployment Rates on Reservation Wages and the Duration of Search for a Job. *Applied Economics*, Vol. 35 (13), 1469-1476.

Havnes, T., and Mogstad, M., (2011). Money for Nothing? Universal Child Care and Maternal Employment. *Journal of Public Economics*, Vol. 95 (11), 1455-1465.

Heckman, J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, Vol. 47 (1), 153-161.

Hillman, A., Cannella, A., and Paetzold, R. (2000). The Resource Dependence Role of Corporate Directors: Strategic Adaptation of Board Composition in Response to Environmental Change. *Journal of Management Studies*, Vol. 37 (2), 235-256.

Hillman, A., Shropshire, C., and Cannella, A. (2007). Organizational Predictors of Women on Corporate Boards. *Academy of Management Journal*, Vol. 50 (4), 941-952.

Hirsch, B., Schank, T., and Schnabel, C. (2010). Differences in Labor Supply to Monopsonistic Firms and the Gender Pay Gap: an Empirical Analysis Using Linked Employer–Employee Data from Germany. *Journal of Labor Economics*, Vol. 28 (2), 291-330.

Holman, D. (2013). Job Types and Job Quality in Europe. *Human Relations*, Vol. 66 (4), 475-502.

Hui, W. (1991). Reservation Wage Analysis of Unemployed Youths in Australia. *Applied Economics*, Vol. 23 (8), 1341-1350.

Huse, M., and Solberg, A. (2006). Gender-Related Boardroom Dynamics: How Scandinavian Women Make and Can Make Contributions on Corporate Boards. *Women in Management Review*, Vol. 21 (2), 113-130.

Iacovou, M., and Skew, A. (2010). Household Structure in the EU. *ISER Working Paper Series* No.10.

International Labour Organization (ILO) (2014). Women in Business and Management: Gaining Momentum, available at: http://www.ilo.org/.

International Labour Organization (ILO) (2017). World Employment and Social Outlook: Trends for women 2017. International Labour Office: Geneva, available at: http://www.ilo.org.

Istat (2011). "Rilevazione sulle forze di lavoro", Istat, Roma.

Istat (2012), "La scuola e le attività educative", available at: http://www.istat.it/

Istat (2014), "L'offerta comunale di asili nido e altri servizi socio-educativi per la prima infanzia", available at: http://www.istat.it/it/archivio/129403.

Istat (2015), "Bilancio demografico nazionale", available at: http://www.istat.it/it/archivio/162251.

Istat (2016), "Rilevazione sulle forze di lavoro", available at: http://www.istat.it/.

Istat (2017a). "Rilevazione sulle forze di lavoro", Istat, Roma.

Istat (2017b). Rilevazione sulle Forze di Lavoro: Informazioni sulla Rilevazione, Istat:Roma, available at https://www.istat.it/

Jann, B. (2008). The Blinder-Oaxaca Decomposition for Linear Regression Models. The *Stata Journal*, Vol. 8 (4), 453-479.

Jones, S. (1988). The Relationship Between Unemployment Spells and Reservation Wages as a Test of Search Theory. *The Quarterly Journal of Economics*, Vol. 103 (4), 741-765.

Kabeer, N., and Natali, L. (2013). Gender Equality and Economic Growth: Is there a Win-Win? *IDS Working Papers*, Vol. 2013 (417), 1-58.

Kalenkoski, C., Ribar, D. and Stratton, L. (2009). The Influence of Wages on Parents' Allocations of Time to Child Care and Market Work in the United Kingdom. *Journal of Population Economics*, Vol 22 (2), 399-419.

Kalenkoski, C., Ribar, D., and Stratton, L. (2005). Parental Child Care in Single-Parent, Cohabiting, and Married-Couple Families: Time-Diary Evidence from the United Kingdom. *American Economic Review*, Vol. 95 (2), 94-198.

Kidd, M. (1993). Sex Discrimination and Occupational Segregation in the Australian Labour Market. *Economic Record*, Vol. 69 (1), 44-55.

Kiefer, N., and Neumann, G. (1979). An Empirical Job-Search Model, with a Test of the Constant Reservation-Wage Hypothesis. *Journal of Political Economy*. Vol. 87 (1), 89-107.

Killingsworth, M. and Heckman, J. (1986). Female Labor Supply: A Survey. In: *Handbook of Labor Economics*. Vol. 1, Oxford: Elsevier, 1999, 103-204.

Kimmel, J. (1998). Child Care Costs as a Barrier to Employment for Single and Married Mothers. *The Review of Economics and Statistics*, Vol. 80 (2), 287-299.

Kimmel, J., and Connelly, R. (2007). Mothers' Time Choices: Caregiving, Leisure, Home Production, and Paid Work. *The Journal of Human Resources*. Vol. 42 (3), 643-681.

Kimmel, J., and Connelly, R. (2009). Spousal Influences on Parents' Non-market Time Choices. *Review of Economics of the Household*, Vol. 7 (4), 361-394.

Klevmarken, N. (2005). Estimates of a Labour Supply Function Using Alternative Measures of Hours of Work. *European Economic Review*, Vol. 49 (1), 55-73.

Koenker, R., and Bassett, G. (1978). Regression Quantiles, *Econometrica*. Vol. 46 (1), 33-50.

Kooreman, P., and Kapteyn, A. (1987). A Disaggregated Analysis of the Allocation of Time within the Household. *Journal of Political Economy*, Vol. 95 (2), 223-249.

Lancaster, T., and Chesher, A. (1983). An Econometric Analysis of Reservation Wages. *Econometrica*, Vol. 51 (6), 1661-1676.

Lancaster, T., and Chesher, A. (1984). Simultaneous Equations with Endogenous hazards. In *Studies in Labor Market Dynamics*, Springer-Verlag, Heidelberg, Vol. 11, 16-44.

Lange, T. (2012). Job Satisfaction and Self-Employment: Autonomy or Personality?. *Small Business Economics*, Vol. 38 (2), 165-177.

Lee, L. (1983). Generalized Econometric Models with Selectivity. *Econometrica*, Vol.51 (2), 507-512.

Leibowitz, A., Klerman, J., and Waite, L. (1992). Employment of New Mothers and Child Care Choice: Differences by Children's Age. *The Journal of Human Resources*, Vol. 27 (1), 112-133.

Leibowitz, A., Waite, L., and Witsberger, C. (1988). Child Care for Preschoolers: Differences by Child's Age. *Demography*, Vol. 25, 205-220.

Lombard, K. (2001). Female Self-Employment and Demand for Flexible, Nonstandard Work Schedules. *Economic inquiry*, Vol. 39 (2), 214-237.

Longstreth, M., Stafford, K., and Mauldin, T. (1987). Self-employed Women and their Families: Time Use and Socio-Demographic Characteristics, *Journal of Small Business Management*, Vol. 25 (3), 30–37.

Lopez, R. (1984). Estimating Labour Supply and Production Decisions of Self-Employed Farm Producers, *European Economic Review*, Vol. 24 (1), 61-82.

Luciano, M., Sampogna, G., del Vecchio, V., Giacco, D., Mulè, A., de Rosa, C., Fiorillo, A., and Maj, M. (2012). The Family in Italy: Cultural Changes and Implications for Treatment. *International Review of Psychiatry*, Vol. 24 (2), 149-156.

Lundin, D., Mörk, E., and Öckert, B. (2008). How Far Can Reduced Childcare Prices Push Female Labour Supply?. *Labour Economics*, Vol. 15 (4), 647-659.

Machado, J., and Mata, J., (2005). Counterfactual Decompositions of Changes in Wage Distributions Using Quantile Regression. *Journal of Applied Econometrics*, Vol. 20 (4), 445-465.

Manning, A. (2003). *Monopsony in Motion: Imperfect Competition in Labor Markets*. Princeton, NJ: Princeton University Press.

Matteazzi, E., Pailhé, A. and Solaz, A. (2014). Part-time Wage Penalty for Women in Prime Age: A Matter of Selection or Segregation? Evidence from Four European Countries. *Industrial and Labor Relations Review*, Vol. 67 (3), 955-985.

McCall, J. (1970). Economics of Information and Job Search. *The Quarterly Journal of Economics*, Vol. 84 (1), 113-126.

Melly, B. (2005). Decomposition of Differences in Distribution Using Quantile Regression. *Labour Economics*, Vol. 12 (4), 577-590.

Michalopoulos, C., Robins, P., and Garfinkel, I. (1992). A Structural Model of Labor Supply and Child Care Demand. *The Journal of Human Resources*, Vol. 27 (1), 166-203.

Mortesen, D. (1986). Job Search and Labor Market Analysis. In: Ashenfelter, O., and Layard, R., *Handbook of Labor Economics*, Vol. 2, Elsevier, 849-919.

Mussida, C., and Picchio, M. (2014). The Gender Wage Gap by Education in Italy. *The Journal of Economic Inequality*, Vol. 12 (1), 117-147.

Narendranathan, W., and Nickell, S. (1985). Modelling the Process of Job Search. *Journal of Econometrics*, Vol. 28 (1), 29-49.

Noseleit, F. (2014). The Impact of Childcare Enrollment on Women's Selection into Self-Employment, *Maastricht School of Management Working Paper* No. 15.

Oaxaca, R. (1973). Male-female Wage Differentials in Urban Labor Markets. *International Economic Review*, Vol. 14 (3), 693-709.

OECD (2015). "LFS by sex and age - indicators", available at: https://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R

OECD (2015). Entrepreneurship at a Glance 2015. OECD Publishing: Paris, https://doi.org/10.1787/entrepreneur_aag-2015-en.

OECD (2017a). "Employment Rate (indicator)". doi: 10.1787/1de68a9b-en.

OECD (2017b). The Pursuit of Gender Equality: An Uphill Battle. *OECD Publishing*: Paris, available at: https://doi.org/10.1787/9789264281318-en.

OECD (2017c), "Average Annual Wages", available at: https://stats.oecd.org/

OECD (2018a). Family Database, available at: www.oecd.org/els/family/database.htm.

OECD (2018b). Is the Last Mile the Longest? Economic Gains from Gender Equality in Nordic Countries, *OECD Publishing:* Paris, available at: https://doi.org/10.1787/9789264300040-en.

OECD (2018c), "Time Use", available at: https://stats.oecd.org/

Ongaro, F. (2002). Explanatory and Socio-Economic Factors to Understand the Low Fertility Rates in Italy: Implication for Research. Paper presented at the 41st Conference of the Italian Statistical Society, 5 – 7 June.

Pacelli L., Pasqua S., and Villosio C. (2013). Labor Market Penalties for Mothers in Italy. *Journal of Labor Research*, Vol. 34 (4), 408-432.

Pagani, L. (2003). Why Do People from Southern Italy Seek Jobs in the Public Sector?. *LABOUR*, Vol. 17 (1), 63-91.

Pagani, L., and Marenzi, A. (2008). The Labor Market Participation of Sandwich Generation Italian Women. *Journal of Family and Economic Issues*, Vol. 29 (3), 427-444.

Parker, S. (2009). The Economics of Entrepreneurship. *Cambridge University Press*: Cambridge.

Parker, S., Belghitar, Y., and Barmby, T. (2005). Wage Uncertainty and Self-employed Labour Supply. *Economic Journal*, Vol. 115 (502), C190-C207.

Polacheck, S. (1981). Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *Review of Economics and Statistics*, Vol. 63 (1), 60-69.

Powel, L. (1998). Part-time versus Full-time Work and Child Care Costs: Evidence for Married Mothers. *Applied Economics*, Vol. 30 (4), 503-511.

Powell, G. (1999). *Handbook of Gender & Work*, London: Sage Publications

Prasad, E. (2003). What Determines the Reservation Wages of Unemployed Workers? New Evidence from German Micro Data. *IZA Discussion Paper* No. 694.

Rammohan, A., and Whelan, S. (2007). The Impact of Childcare Costs on the Full-Time/Part-Time Employment Decisions of Australian Mothers. *Australian Economic Papers*, Vol. 46 (2), 152-169.

Rees, H. and Shah, A. (1986). An Empirical Analysis of Self-Employment in the UK, *Journal of Applied Econometrics*, Vol. 1 (1), 95-108.

Reilly, B. (1991). Occupational Segregation and Selectivity Bias in Occupational Wage Equations: An Empirical Analysis Using Irish Data. *Applied Economics*, Vol. 23(1), 1-8.

Ribar, D. (1992). Child Care and the Labor Supply of Married Women: Reduced Form Evidence. *The Journal of Human Resources*, Vol. 27 (1), 134-165.

Ribar, D. (1995). A Structural Model of Child Care and the Labor Supply of Married Women. *Journal of Labor Economics* Vol. 13 (3), 558-597.

Rizzica, L. (2015). The Use of Fixed-term Contracts and the (Adverse) Selection of Public Sector Workers. *Bank of ItalyWorking Paper* No. 1041.

Robinson, J. (1933). *The Economics of Imperfect Competition*. London: Macmillan.

Rosti, L., and Chelli, F. (2005). Gender Discrimination, Entrepreneurial Talent and Self-Employment. *Small Business Economics*, Vol. 24 (2), 131-142.

Rotschild, M. (1974). Searching for the Lowest Price When the Distribution of Prices Is Unknown. *Journal of Political Economy*, Vol. 82 (4), 689-711.

Sabatier, M. (2015). A Women's Boom in the Boardroom: Effects on performance?. *Applied Economics*, Vol. 47 (26), 1-11.

Sandow, E. (2008). Commuting Behaviour in Sparsely Populated Areas: Evidence From Northern Sweden. *Journal of Transport Geography*. Vol. 16 (1), 14-27.

Sestito, P., and Viviano, E. (2011). Reservation Wages: Explaining Some Puzzling Regional Patterns. *LABOUR*, Vol. 25 (1), 63-88.

Solon, G., Haider, S., and Wooldridge, J. (2013). What Are We Weighting For?. *NBER Working Paper* No. 18859

Sousa-Poza, A. and Sousa-Poza, A. (2003). Gender Differences in Job Satisfaction in Great Britain, 1991–2000: Permanent or Transitory?. *Applied Economics Letters*, Vol. 10 (11), 691-694.

Stolzenberg, R., and Waite, L., (1984) Local Labor Markets, Children and Labor Force Participation of Wives. *Demography*, Vol. 21 (2), 157-170.

Tekin, E. (2007). Childcare Subsidies, Wages, and Employment of Single Mothers. *Journal of Human Resources*, Vol. 42 (2), 453-487.

Thébaud, S. (2011). Social Policies and Entrepreneurship: Institutional Foundations of Gender Gaps across 24 Countries. *Academy of Management Best Paper Proceedings*, Vol. 2011 (1), 1-6.

Thornton, J. (1998). The Labour Supply Behaviour of Self-Employed Solo Practice Physicians. *Applied Economics*, Vol. 30 (1), 85-94.

Trostel P., Walker, I., and Woolley, P. (2002). Estimates of the Economic Return to Schooling for 28 Countries. *Labour Economics*, Vol. 9 (1), 1-16.

van den Brink, H., and Groot, W. (1997). A Household Production Model of Paid Labor, Household Work and Child Care. *De Economist*, Vol. 145 (3), 325-343.

van Ophem, H., Hartog, J., and Berkhout, P. (2011), Reservation Wages and Starting Wages. *IZA Discussion Paper* No. 5435.

Vejsiu, A. (2011). Incentives to Self-Employment Decision in Sweden. *International Review of Applied Economics*, Vol. 25 (4), 379-403.

Vella, F. (1998). Estimating Models with Sample Selection Bias: A Survey. *The Journal of Human Resources*, Vol. 33 (1), 127-169.

Venturini, A., and Villosio, C. (1998). Foreign Workers in Italy: Are They Assimilating to Natives? Are They Competing Against Natives? An Analysis by the S.S.A. Dataset. *IZA Discussion Paper* No. 3.

Waldfogel, J. (2002). Child Care, Women's Employment, and Child Outcomes. *Journal of Population Economics*, Vol. 15 (3), 527-548.

Wales, T. (1973). Estimation of a Labor Supply Curve for Self-Employed Business Proprietors. *International Economic Review*, Vol. 14 (1), 69-80.

Wellington, A. (2001). Health Insurance Coverage and Entrepreneurship. *Contemporary Economic Policy*, Vol. 19 (4), 465-478.

Wellington, A. (2006). Self-Employment: The New Solution for Balancing Family and Career?. *Labour Economics*, Vol. 13 (3), 357-386.

Wooldridge, J. (2002). *Econometric Analysis of Cross Section and Panel Data*. London: MIT Press.

WEF (2017). The Global Gender Gap Report 2017. Switzerland: *World Economic Forum*.

Yang, Q., and Guo, F. (1996). Occupational Attainments of Rural to Urban Temporary Economic Migrants in China, 1985-1990. *The International Migration Review*, Vol. 30 (3), 771-787.