

# From Bosses to Babies: Unraveling the Gendered Link between Self-Employment Types and Fertility in Italy<sup>1</sup>

Francesco C. Billari  
Bocconi University and Nuffield College  
[francesco.billari@unibocconi.it](mailto:francesco.billari@unibocconi.it)

Berkay Özcan  
London School of Economics  
[B.Ozcan@lse.ac.uk](mailto:B.Ozcan@lse.ac.uk)

Concetta Rondinelli  
Bank of Italy  
[concetta.rondinelli@bancaditalia.it](mailto:concetta.rondinelli@bancaditalia.it)

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We study whether (and why) self-employed individuals have higher fertility than employees. Macro- and micro-level studies have produced inconsistent findings. Self-employment has been associated with income uncertainty and instability and may be negatively related to fertility. However, self-employment also implies workplace flexibility and higher potential income and may positively affect fertility. These mechanisms operate differently for men and women. We use the data from Italian Survey on Household Income and Wealth (1995-2014), which includes objective and subjective fertility measures, and distinguish between three types of self-employment: laborer (solo) self-employment, entrepreneurship, and professionals. We show that all self-employed men and laborer self-employed women have higher fertility than comparable wage earners of the same sex. Using an instrumental variable treatment-effect regression approach and work histories, we show that self-employment *causes* higher fertility. We provide suggestive evidence that entrepreneurs have more children because they would pass their business to their offspring (and rely on the family labor supply). Contrary to the US studies, Italian women do not perceive self-employment as facilitating work-life balance or convenient form of employment for childbearing.

Key Words: Self-Employment, Gender, Fertility, Entrepreneurship, Children

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Corresponding Author: Berkay Özcan, [B.Ozcan@lse.ac.uk](mailto:B.Ozcan@lse.ac.uk)

## 1. Introduction

The opportunity, or cost, to combine work and family has emerged as a primary determinant of fertility levels in advanced societies. This factor has become particularly central with the ‘gender revolution’ unfolding, as women reached and surpassed men’s educational attainment and significantly increased their labor force participation (Goldin 2021; Esping-Andersen & Billari, 2015; Goldscheider, Bernhardt, & Lappegård, 2015; McDonald, 2000). Scholars see a possible shift from the “male breadwinner” model/paradigm, in which the stability of the employment and income provided by a man was paramount, to an era described by Goldscheider et al. (2015) as the “second half” of the gender revolution, in which men’s ability to balance work and family is central in defining family outcomes.

Employment type is a key factor in shaping the opportunity and cost of balancing work and family. For example, compared to wage-employment, self-employment embodies multiple positive and negative aspects of work, such as workplace flexibility, autonomy, income instability and insecurity. However, the relationship between employment type and fertility is poorly understood. From a macro, cross-national perspective, a negative association between self-employment and total fertility rates has been documented in the era of low and lowest-low fertility (e.g., Adsera, 2004, 2005, and 2011). In this research, following the literature focusing on Southern European countries, self-employment is treated as one of the various forms of insecure or precarious employment, and hence, a possible causal factor in very low fertility levels. From a micro perspective, studies on the relationship between employment type and fertility have often studied only women’s self-employment, treating it as a flexible form of employment that enables them to achieve a better work-life balance following childbirth (see Simoes et al. (2016) for a review of the literature). In contrast, focusing on high-powered female professionals in the USA, Goldin and Katz (2011) found that the transition from professional self-employment to wage-earning improved work-life balance of women in specific sectors, such as pharmacists (Goldin & Katz, 2011; 2016).

One of the reasons for the inconsistency in findings on the relationship between self-employment and fertility is the range of self-employment definitions used. Different types of self-employment imply differences regarding resources and constraints, which accrue differentially to men and women (Arum & Müller, 2004; Budig, 2006). Moreover, from a

gender perspective, the literature on self-employment and family paid limited attention to men<sup>1</sup>, which is regrettable as they are more likely to be self-employed or entrepreneurs.

In this paper, using data from the Italian Survey on Household Income and Wealth (SHIW) on objective and subjective measures of fertility, such as completed fertility, fertility intentions and self-reported reasons for not having children, we investigate i) whether the self-employed Italians have (and want) more children than similar wage-employees, ii) whether this relationship is causal, iii) and what mechanisms explain the relationship between self-employment and children for men and women. Providing a comprehensive examination of this relationship is important also because both fertility and self-employment respond to specific labor market policies (i.e. unemployment benefits, basic income schemes). Relatedly, fertility and entrepreneurship are considered policy targets for governments aiming to increase both.

We distinguish three groups of self-employed: laborer (solo) self-employed (*laborer SE*), entrepreneurs, and self-employed professionals (*professional SE*). We show that they differ significantly regarding a wide range of observed characteristics. In the first part of the paper, we provide careful descriptive analyses to show that self-employed individuals have a higher number of children (ever born to them) than similar wage employees after controlling for a range of factors and fixed effects. Then, we examine the causal direction because selection into self-employment and parenthood happen simultaneously. We offer various analytical strategies to tackle both the reverse causality and endogeneity. To rule out reverse causality, we use a question about work histories of individuals and compare the fertility of those who have always been self-employed to those who have always been employees since their first entry in the labor market. Potential endogeneity is addressed by means of an instrumental-variable treatment-effect regression approach, leveraging the rich SHIW dataset that provides information on inheritance of self-employment (i.e., father's self-employment), while controlling for father's fertility and wealth. While each of these strategies may have limitations, our findings are notable for their consistency across various identification and estimation methods, measures of fertility and subsamples.

We find that, for men, all forms of self-employment, but especially being an entrepreneur, increases their number of children. For women, only being a laborer self-employment has a positive effect on the total number of children ever born. These findings are robust to various

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<sup>1</sup> An exception is the study by Broussard, Chami, & Hess (2015), who focusing exclusively on men, find that self-employed men have more children than wage-earner men in the USA.

checks and consistent across different samples. We investigate two mechanisms that could potentially explain these findings which may operate differently for men and women. The first one is what we call as the “passing the crown” hypothesis, which argues that self-employment, especially in the form of entrepreneurship, motivates individuals to have (more) children to pass the business to their offspring. Using inheritability of different business forms, we show that this hypothesis is suitable to explain men’s results. The second is that self-employment being a flexible form of employment that enables having more children, which is commonly suggested for women. While we find suggestive evidence for the former mechanism, we find no evidence for the latter in Italy.

We make novel contributions to several interdisciplinary literatures (described in the next section) on the nexus of self-employment, entrepreneurship, work-life balance, employment insecurity, and how they interact with gender and fertility. Our study stands out for its comprehensive examination of both actual fertility and subjective fertility intentions, as well as its comparison of sex differences —a departure from previous research that either exclusively focused on men or women or overlooked the heterogeneity in self-employment by considering only one type.

In addition to being a forerunner in lowest-low fertility, Italy is a central case for a study of self-employment and fertility. Self-employment rates have been exceptionally high in Italy compared to all other advanced economies throughout our study window (1994 - 2014) (OECD, 2016). Despite the steady decline over the last two decades, nearly 23% of all workers were self-employed by 2019, which still is the highest among high-income countries (Boeri et al. 2020). Moreover, work-life balance has been shown as a key determinant of fertility levels in Italy, where gender equality is lower than in other Western societies (Cooke, 2009; Mills, Mencarini, Tanturri, & Begall, 2008). Italy has one of the lowest fertility rates in the world despite a slight increase before the Great Recession. These characteristics and the high prevalence of self-employment make Italy not only relevant for our substantive question but also makes self-employment an easier phenomenon to study using a nationally representative survey than other countries. The SHIW data covering two decades of low fertility (1995- 2014) have attractive advantages compared to standard income or labor force surveys, too. It has a large sample size and high-quality information about self-employment types, fertility and fertility intentions, intergenerational links, questions about work-life balance, in addition to detailed information on income, wealth and work hours. These

features make this dataset uniquely appropriate for a comprehensive study of self-employment and fertility.

## 2. Background

### 2.1. Three Faces of Self-Employment

The heterogeneity of self-employed workers regarding skills, experiences, and returns in the labor market has long been recognized. For example, US studies mainly focused on entrepreneurship and have noted stark differences in skill levels, earnings, and resources between incorporated business owners and self-employed with unincorporated business (e.g., Levine and Rubinstein 2017, Özcan 2010). Numerous studies have emphasized the role of different paths towards self-employment in producing such heterogeneity, and distinguished *necessity-driven* self-employed from *opportunity-driven* entrepreneurs (see Fairlie and Fossen 2018 for a review). Another distinction gaining acceptance among economists and used in the OECD publications is between “solo self-employment” which refers to self-employed individuals who do not employ any other paid or unpaid workers and “self-employed individuals with employees” (e.g., OECD 2022; Boeri et al. 2020; Semykina 2018; and Bari et al. 2021). This distinction overlaps with the earlier work by Arum (2004), who first demonstrated the growing polarization between *laborers* vs. *entrepreneurs* within the self-employed (Arum and Muller, 2004), where entrepreneurs employ other workers, and “laborers” correspond to “solo self-employed individuals”.

Despite the distinctions, there exist fluidity and transitions between the types. Many entrepreneurs with workers (or incorporated businesses owners) start out laborers (or solo self-employed (Boeri et al., 2020)). There is also debate about the contours of each of these categories. For example, the laborer type of (solo) self-employed often includes self-employed workers working for a single client. The increasing prominence of the *gig economy* (i.e., flexible work involving digital platforms) has raised further questions about whether self-employed workers with a single client should be treated as self-employed. However, among all self-employed, the fraction participate in the gig economy are considered small. In Italy, for example, only 5% of all self-employed people are estimated to be part of the gig economy by 2017 (Boeri et al. 2020)<sup>2</sup>.

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<sup>2</sup> The last wave in our data is from 2014.

While heterogeneity among the self-employed is increasingly recognized, studies on the nexus of family processes and self-employment have largely ignored it. They either focused only on incorporated business owners as entrepreneurs (Parker, 2008) or do not make any distinction between the various types of self-employment in their analyses (Carr, 1996; Caputo and Dolinsky, 1998; Lombard 2001; Taniguchi, 2002; Bruce, 1999; Brown et al., 2006; Noseleit 2014; Lim 2017, Brossard Chami and Hess 2015, Matysiak and Mynarska 2020). This is surprising because men and women have very different motivations for becoming self-employed and are subject to different constraints, all of which may sort women into less-rewarding types of self-employment than men (Budig, 2006). While men's self-employment is associated with entrepreneurship and mobility, women's self-employment choice has been related to flexibility, children and motherhood (Semykina 2018).

The few studies of the relationship between family, children, and self-employment have made different choices regarding the definition of self-employment. For example, Budig (2006) using occupational codes differentiated between "professional" vs. "non-professional" self-employed for men and women. Goldin and Katz (2011; 2016) focused only on professional self-employed (e.g., pharmacists and MBA holder consultants). Noseleit (2016) excluded women who own family businesses and professional self-employed. Broussard et al. (2015) used US Census data to understand why self-employed men have more children and focused on unincorporated self-employed and incorporated business owners. Bari et al. (2020) focused on solo self-employed as a separate group. Other studies have typically excluded agricultural self-employment but largely ignored the heterogeneity among the self-employed workers (see Matysiak and Mynarska 2020 for Poland; Lim 2019 for the USA).

The heterogeneity of the self-employed in Italy has also long been recognized. Barbieri and Bison (2004) investigated different pathways into three types of self-employed: professional self-employed, skilled self-employed, and unskilled self-employed. More recently, Barbieri et al. (2015) computed motherhood probabilities of different employment types and differentiated self-employed and pseudo-self-employed who perform "tasks on a self-employed basis in subordinate positions" "consultants and freelancers" which are included in the "atypical work" category rather than self-employed. They argue that the motherhood probabilities of self-employed and permanent employees are similar.

Boeri et al. (2020) observed growth in the laborer type of self-employment (solo-self-employment) in Italy in recent years. However, these are not gig workers or freelancers. Transitions into self-employment are much less likely to be from unemployment but more

likely to be from private sector employment. This is consistent with the findings in the previous research on the USA (Özcan and Reichstein 2009) and cast doubt about the conceptualization of self-employment as precarious employment.

## **2.2. How would self-employment types be related to family size and fertility?**

We combine different strands of literature that conceptualize self-employment in diverse ways and describe how it relates to fertility. Drawing from previous research, we categorize self-employed individuals into three types: solo laborers, entrepreneurs with employees, and professional self-employed individuals. Below we elucidate the pathways through which each type of self-employment is linked to family size and fertility.

### *2.1.1 Self-Employment as a Measure of Unstable and Insecure Form of Employment*

The first line of research explores the connection between fertility decision-making and various factors such as labor market uncertainty, employment instability, and income insecurity, because of long term flexibilization of European labor markets throughout 1990s and 2000s. This literature (see the meta-analytical review in Alderotti et al., 2021) has primarily been interested in the role of unemployment (Kreyenfeld and Andersson, 2014; Özcan, Mayer, and Luedicke, 2010; Andersen and Özcan, 2021) and contract type and duration (Pailhé and Solaz, 2012) as measures of uncertainty and insecurity in the labor market. Demographers and sociologists studying fertility under labor market uncertainty have included the self-employed into the groups of individuals with ‘insecure’ employment type (Adsera, 2005, 2011; Tölke and Diewald, 2003; Barbieri et al 2015). According to the latter view, self-employment is an insecure type of employment because self-employed workers assume their own income risks, and hence, predicts a *negative* relationship between self-employment and fertility.

These studies mainly used European datasets and this conceptualization of self-employment often corresponds to laborer type of self-employment, i.e., self-employment without employees (Barbieri and Bison 2004, and Barbieri et al. 2015), as unstable, precarious, insecure form of employment due to lower levels of skills. However, uncertainty and income instability are key aspects present in all three types of self-employments. Thus, from this perspective it is plausible to expect all types of self-employment to have a *negative* association with fertility for both men and women.

### *2.2.2 Self-Employment and Entrepreneurship to Pass the Crown*

Few studies have investigated the nexus between self-employment and family size for men. A notable exception is Broussard et al. (2015), which use the US Current Population Surveys and argue that self-employed men may want to raise their expected number of children to increase the chances that one of the children will be talented and interested in running the business. In other words, having larger family sizes increases the self-employed households' expected return to their business as more children may also provide a higher family labor supply and support for the family business.

However, having children may also increase the parents' concerns with financial issues and introduces an additional motivation for seeking activities that bring higher expected returns such as self-employment (Dawson et al., 2013, Florida et al., 2021). Studies on male self-employment have almost always emphasized men's desire for control over earnings capacity as the primary reason for choosing this type of employment (Hamilton 2000; Van Praag and Versloot 2007). Put differently, self-employment and entrepreneurship are viewed as an alternative vehicle for social mobility for fathers or soon-to-be fathers: when their family grows, men may choose to become self-employed. Altogether, it is unclear which of these two mechanisms dominate both in general and in Italy in particular.

It is important to note that the latter mechanism, similar to the way self-employment offers flexible employment options for women during childrearing (as explained in the next section), considers 'employment type choice' as part of a couple's joint decision regarding labor supply around childbirth. While this may be true for some couples—requiring a different modelling strategy than the one we use—our argument is that there might be an additional causal effect of self-employment on childbearing decisions. In section 3, we aim to test this causal direction and provide suggestive evidence for the former mechanism.

### *2.2.2. Self-Employment for Work-Life Balance (Work hours, Flexibility and Autonomy).*

Another strand of literature is interested in understanding individual determinants and consequences of self-employment and entrepreneurship. Studies in this line of research have rarely focused on fertility and number of children, although they often have included them in their models as 'demographic controls'. Empirical evidence is at best mixed in these studies. For example, studies on the US predominantly find a positive correlation between children and the probability of being self-employed (Blanchflower, 2000; Burke, Fitzroy, and Nolan,



2002; Fairlie and Meyer, 2000). In contrast, Sena et al. (2012) suggest for the UK a *negative* effect of children on the transitions to self-employment, while Georgellis and Wall (2005) and Demirgüç-Kunt et al. (2009), using data from Germany and Colombia respectively, obtain a non-significant effect of children on entry into self-employment.

While the evidence on the effect of children and childbirth on self-employment entry is at best mixed, many studies suggest a *positive* association between self-employment and having children. For example, for women, self-employment implies independence and flexibility in managing work hours, and part-time work is often observed among self-employed women (Jooa, 2016; Semykina 2018, Lim 2019). This flexibility can be perceived as an advantage in the presence of children or for childbearing decisions (e.g., Connely, 1990; Devine 1994). Similarly, there may be various reasons why laborer SE women have more children than comparable employees. For example, laborer SE women may have children earlier given their lower levels of education, and hence, have more time to have more children.

However, contrary to the arguments about flexibility and autonomy, owning a business may require a high amount of time and resources, and self-employed jobs at average are more demanding than wage-sector jobs, all of which may make self-employment difficult to combine with children (Fairchild, 2009). This is particularly true for entrepreneurs. Goldin and Katz (2011; 2016) argue that self-employed individuals in high-skilled professions with fixed workplaces (e.g., pharmacists, lawyers) may need to spend longer hours at work due to agency problems, making self-employment less conducive to achieving work- and family-life balance.

According to one study based on American Time Use data, self-employed women spend the least amount of time on work activities (1 hour less than wage-earning women per day) and significantly more time on childcare than comparable wage-earning women (Gurley-Calvez, Biehl and Harper, 2009). These patterns are not observed for highly skilled women (with post-graduate degrees), but they are robust to controlling for education, industry, and a variety of demographic factors. The authors interpret them as supporting the idea that women choose self-employment for family, not earnings, reasons. This suggests an inverse relationship, rather than self-employment leading to more children.

European research shows divergent findings compared to the US. Self-employment in Europe is not seen as a method to balance work and family life. Studies indicate that self-employment can lead to delayed childbearing (Noseleit, 2014; Del Boca, Pasqua, & Pronzato,

2005; Matysiak & Mynarska, 2020), with a focus on transitions into motherhood rather than total fertility. Barbieri et al. (2015) suggest that non-standard employment, like precarious self-employment, negatively impacts fertility among highly educated women, especially in Southern European countries, while it may accelerate the transition to motherhood for low-educated women, and hence, generating a higher number of children compared to a similar wage employee women at earlier ages. Our examination of age patterns in section 4.3 will offer further evidence supporting this argument.

### 3. Data, Sample and Measures

We use the data from the Bank of Italy's Survey on Household Income and Wealth (SHIW). The SHIW is a large-scale biennial household survey, which samples about 8,000 households and 22,000 individuals per wave. We use individual-level data and pool 10 waves between 1995 and 2014. Our sample includes 104,631 individuals aged between 20 and 69 years, accruing to. We employ cross-sectional sample weights to ensure representativeness for the Italian resident population (Faiella and Gambacorta, 2007).

The SHIW data is especially advantageous. First, it allows to construct<sup>3</sup> three distinct types of self-employment: i) self-employed professionals (*Professional SE*); ii) small business owner/employers and/or working shareholders/partners of a business (*Entrepreneur*), iii) own-account workers/craft workers, owners or members of a family business without employees, contingent workers on own account, such as regular or occasional collaborators, project workers, which we call laborer self-employed (*Laborer SE*)<sup>4</sup> following the labels used in Arum and Mueller (2004). One of the primary distinctions between entrepreneurs and laborers is that the former employ people other than unpaid family members. Laborer SE definitions are very similar to "solo self-employed" in recent economics literature.

Second, although SHIW is not a demographic survey, it provides high quality measures of fertility. Our main outcome variable is the *number of children ever born to an individual*, i.e., all children born to an individual, whether or not living in the household at the time of the

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<sup>3</sup> See Appendix 1 for details.

<sup>4</sup> Additional information, such as the share of the business owned and the number of employees in the SHIW, helps in differentiating between an entrepreneur and a laborer SE. An entrepreneur is a small business owner who is i) an own-account worker who owns 100% of the company and employs more than one payroll employee, or ii) a family business owner who owns more than 50% of the company and employs more than one employee. If a small business owner owns 100% of the company and employs no one, we classify them as Laborer SE.

interview.<sup>5</sup> Additionally, the survey asked questions about “fertility intentions” in the 2002, 2004, 2006 and 2008 waves to couples where the woman is aged 45 years or less. Finally, the SHIW provides information on parental self-employment, the number of siblings of the respondents and their partners, which enables us to study intergenerational links.

### **3.1. Sample Description and Self-Employment Types**

Table 1 shows the differences between the three types of self-employed and the employees. The summary statistics refer to the sample used in our baseline specification which pools all cross-sectional surveys between 1995 and 2014. Table 1 shows descriptive statistics after using sample weights to ensure representativeness for Italian population.

[Table 1 about here]

For men, the laborer SE and entrepreneur have significantly more children (1.7 children) than employees and professional SE, who have roughly the same number of children (1.5). The pattern for women is like the pattern for men. The number of children is higher for laborer SE (1.6), followed by entrepreneurs (1.5) and employed women (1.35). Professional SE women have the lowest fertility rates (about 1.2).

Importantly, self-employed workers work more weekly hours than employees. Among self-employed workers, average weekly work hours are greatest for entrepreneurs (50 hours for men, 42 hours for women) and lowest for the self-employed professionals (~45 hours for men and 36 hours for women). Women’s median hours are slightly above their mean hours. However, the differences between each type of self-employed and employees are similar. In our sample, employee women work ~4 hours (per week) less than professional SE women, ~7 hours less than laborer SE women, and ~8.5 hours less than female entrepreneurs. These large differences show that, on average, woman in each self-employment type has less time for anything, including the family, than those in employment. This is in line with previous research (Millan et al 2013; Boeri et al 2020).

Further differences emerge. Self-employed professionals are the most educated (about 50% of men and 70% of women hold a university degree), as expected. However, there are still some self-employed professionals without a college degree, as shown, where 43% of men

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<sup>5</sup> Using children living at home at the time of the interview to proxy the children born to an individual is the basis of the ‘own child’ method to estimate women’s fertility (Cho, Retherford, and Choe, 1986) and has been widely used (Coleman and Dubuc 2010) even if it leads to the underestimation of fertility for older women.

and 26% of women. The distributions by education of male employees and entrepreneurs are broadly comparable. The laborer SE workers have the lowest level of education. These distributions are similar for men and women. Male employees work predominantly in the manufacturing, energy industry, public administration and private services, while women employees are concentrated in “public administration and private services” (60% of them are in this category).<sup>6</sup> These statistics are in line with official statistics for this time period.

Our sample is unbalanced towards married individuals, which may reflect the age distribution (see section 4.3 on age variation). Still about 30% of professional SE women are single. Annual net household income for employees and laborers is in the same range (above €30,000 at 2010 prices); income for professional SE and entrepreneurs is higher than that for employees and laborers (~€50,000). On average all types of self-employed individuals are richer than employees. Mean net worth for male employees (€176,390) is lower to that owned by laborer SE (€326,960), which is turn is lower to that of Professionals SE (€491,384) and entrepreneurs (€684,794). Indeed, these differences between the types of self-employed and employees are informative about the resources and constraints available for childbirth.

## 4. Empirical Strategy

### 4.1. How are different types of self-employment related to higher number of children?

We begin by estimating a baseline specification to analyze whether self-employment types are associated with having a higher number of children (ever born) once we control for the observed differences between the three types of self-employed and the wage-employees described so far. In short, we estimate versions of the following specification separately for men and women:

$$numkid_{it} = \alpha + \beta \text{entrep}_{it} + \gamma \text{labor}_{it} + \delta \text{profe}_{it} + \mu \text{outlf}_{it} + X_i + \mu_t + \epsilon_{it} \quad (1)$$

where the dependent variable is the number of children ever born to individual  $i$  ( $i=1, \dots, N$ ) at a specific survey wave  $t$  ( $t=1995, \dots, 2014$ ). We are interested in the coefficients  $\beta$ ,  $\gamma$  and  $\delta$ , where *entrep*, *labor* and *profe* are dummy variables equal to one for entrepreneurs, laborer SE and professional SE, respectively and zero otherwise. The reference category becomes *being an employee*, as we also include a dummy variable for being out of the labor force (*outlf*). ( $X_i$ ) represents a broad range of controls that include full set of age dummies (20-68),

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<sup>6</sup> This is a combined category. Obviously, all self-employed groups work in private services rather than public administration (such as 77% for professional SE women).

education dummies, 7 birth cohort dummies (<1939; between 1940 and 1946; 1947 and 1952; 1953 and 1956; 1959 and 1965; 1965 and 1971 and >1971), indicators of marital status, place of birth (Italy/abroad), area of residence (North, Center, South), city size (20,000-40,000; 40,000-500,000; more than 500,000 inhabitants, see appendix 1 for variable description). Industry and survey-year fixed-effects ( $\mu_t$ ) are included and  $\epsilon_{it}$  denotes the random error term.

The specification (1) is similar to that of Broussard, Chami, and Hess (2015). However, we expand their framework in two main ways (in addition to including cohort, age and year fixed effects): i) in several specifications, we include partner characteristics and estimate the model in a couple-sample, ii) we include log household income and wealth from previous year as proxies of financial resources, which are considered key for self-employment and entrepreneurship (Hurst and Lusardi, 2004). However, since these variables are potentially endogenous to employment types, we also report results of specifications omitting them. We estimate these models using OLS. However, since the outcome variable is a count variable - the number of children- we also estimate using a Poisson regression for robustness (see the appendix 2, Table A1).

## 4.2. Results

Estimates are reported in Table 2, where columns (1-4) show men's estimates, and columns (5-8) report women's estimates. Columns 1 and 5 show estimates for the baseline specification, columns 2 and 6 adds the father's self-employment and (log) household income in the previous year, columns 3 and 7 the (log) household net worth in the previous year, columns 4 and 8 the partner's employment types/status, restricting the sample to those living in couple.

[Table 2 about here]

For men, the headline finding is that all types of self-employed have more children than employees across the four model specifications. Controlling for all the factors listed above reduces somewhat the coefficient sizes for entrepreneurs but leaves them with the largest number of children (0.11 more children than employees, see column 4). Adding controls to the baseline specification in subsequent columns does not change the coefficients for laborer and professional SE, which are positive, comparable in size and stable across models.

For women, the estimates from the baseline specification are like those for men, except the coefficients for professional SE women, which are not statistically significant. Female entrepreneurs on average have 0.13 children more than female employees (where the average number of children for female entrepreneurs are 1.5). However, including further controls reduces considerably the coefficient size for entrepreneurs, and even makes it statistically not significant when we control for the spouse's employment type (column 8). In column 8, the coefficient for the husband being an entrepreneur becomes large, positive, and statistically significant. The most striking finding, however, is that being a laborer SE is associated with having 0.07 more children than being an employee in all models (i.e., a 4% increase over 1.7 children), and the association is statistically significant. The coefficient for laborer SE wife in column 5 for men matches the coefficient for laborer SE wife in the couple-sample (column 8), which is reassuring. The findings from estimating the same specifications using Poisson link (Table A1) and keeping in the sample only those working more than 20 hours per week (Table A7) are qualitatively similar.<sup>7</sup>

Overall, we find a consistent positive association between different types of self-employment and the number of children for men, remaining robust across various specifications.

However, for women, the association is statistically significant and robust only for laborer self-employed individuals. While the estimates are partially moderated by introducing controls, they align closely with results from the couple sample. Notably, the positive association between entrepreneurship and more children for women diminishes in the couple sample when we account for partner characteristics, suggesting that having an entrepreneur husband or family businesses may drive this association. Nevertheless, we exercise caution in making causal claims based on the findings in Table 2, despite incorporating a range of controls and fixed effects to mitigate obvious confounders.

### **4.3. Completed Fertility and the Age Variation**

While we flexibly controlled for age by including full set of age dummies (in Table 2), there are compelling reasons to investigate the relationship between self-employment and fertility

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<sup>7</sup> In Italy, the north-south divide also matters due to differing prevalence and types of self-employment in these regions. While region fixed-effects are included to account for these differences, separate estimations for North and South Italy (Appendix 2, Table A3) reveal that the positive association between professional self-employed men and fertility is mainly driven by those in the South. The link between laborer self-employment and fertility is not statistically significant in the South. Similarly, for women, being a laborer self-employed matters only in the North (i.e., In the South, the coefficient becomes negative, though not statistically significant).

separately for younger and older people. For example, the association may differ for younger women who are still within the fertility window versus older women who have completed their fertility. Furthermore, Table 1 shows significant age differences across the various types of self-employed. This supports Liang, Wang, and Lazear (2018)'s claim that age is the most important demographic characteristic for entrepreneurship. According to Barbieri et al. (2015), in Southern Europe, motherhood transitions at different ages are especially pronounced for different employment types.

Therefore, we analyze the previous specifications separately for individuals under and over the age of 45 (see appendix Table A2). Given that the SHIW asks couples about their fertility plans at age 45 and median ages are 47 (women) and 49 (men), this cutoff is reasonable. These analyses also help us compare and understand the findings on the analyses related to mechanisms (see next sections) which exploits the survey questions asked only to women under 45. Among men, entrepreneurs, and self-employed professionals older than 45 have more children than employees, while being a laborer SE is statistically significant only for younger men, indicating it may serve as a pathway to entrepreneurship. Notably, the positive coefficient for laborer self-employed women is driven by younger women, with no significant association observed for older women across all self-employment types. Interestingly, for younger women, partner employment types are not influential, but for older women, having a self-employed husband, particularly an entrepreneur, is associated with having more children. These findings suggest that laborer self-employed women tend to have children *earlier* than employees, possibly driving our earlier results.

Figure 1 shows how the predicted number of children for all employment types - estimated based on a specification where we interact employment types with age dummies, and we control for all other factors included in columns 3 and 7 of Table 2 – however, we report by (fewer) age-groups for ease of interpretation.

[Figure 1 here]

For men, there is no difference between self-employed and employees in their twenties. After controlling for observed characteristics, the number of children is the largest (and statistically significant) for entrepreneurs aged 30-39, followed by laborer SE. Until 60-69 years old, when there is no statistically significant difference between any groups, entrepreneurs have consistently more children than employees. Thus, entrepreneurs and laborers are very different from professional SE, who have much fewer predicted children (by about 0.3

children) between the ages 30-39. Professional SE catches up with the other self-employed in the next age group and exceeds employees.

For women, again, the laborer SE has the highest level of fertility, followed by entrepreneurs. While the difference between laborer SE and employees becomes apparent during 30-39, it is only statistically significant during ages 40-49. Entrepreneur and employee women do not differ during the early twenties, and entrepreneur women-only catches up with laborer SE women after mid-30s, departing from the levels of the employee women. However, by ages 40-49, there are no statistically significant differences between any of the employment types.

These findings are consistent with the interpretation that laborer SE women and entrepreneur women might have their children earlier than the employed ones. However, employed women catch up after the fertility window is closed (note that the flattened parts of the curves are still separated). Consistent with Table A2, there is no statistically significant difference between the groups during the ages in which all women are out of their fertility window.

#### **4.4. Fertility Intentions: An alternative measure**

The SHIW provides additional information about couples' fertility intentions where the woman is 45 years old or younger between 2002 and 2008 (in four waves only). Given previous findings, it is worthwhile to study whether their plans for becoming a parent or having another child differ between different types of self-employed and employees. Fertility intentions offer an alternative outcome that helps us bridge the gap between theoretical predictions about fertility decisions and observed fertility outcomes for each employment state. For example, suppose we find any positive association between a self-employment type and the intention to have a(nother) child in the future. In that case, this could be interpreted as self-employment being viewed as more conducive for (an additional) childbirth than being an employee. This is informative and complementary to our analyses because, until now, we have focused on the total number of children ever born, a proxy for "*family size*" rather than *childbirth decisions*.

To investigate intentions, we construct two binary dependent variables from the specific survey question, which asks: "Do you plan to have (more) children in the future?". The woman reports the answers for the couple. Our first dependent variable takes the value one if the woman answers a definite "yes" and zero otherwise (which includes other deliberations, such as "not now, we will think about it later" or "no"). Our second dependent variable takes the value one if the woman gives a definite "no, I (we) do not want any (more) children" and



zero otherwise. We estimate several linear probability models (LPM) specifications separately by parity using these binary measures. The estimates are shown in Table 3 below.

[Table 3 about here]

In column (1) we report the estimates for women under 45, in column (2) those for childless couples, in column (3) those for couples with one or two children and column (4) those for couples with three or more children. In Panel A of Table 3, female laborers are less likely to say that they plan to have children in the future than employees if they are childless or have already three or more children. Women in other types of self-employment are not statistically significantly different from employee women. Professional SE women report to plan to have a child when they already have one or two children (but less when they already have three or more). However, these coefficients are statistically significant only at the 10% level.

The estimates in Panel B are consistent with those in Panel A. Only laborer SE women are more likely than employees to report that they do not want any (more) children, which seems to be driven by those who already have more than three children. Childless laborer SE women are less likely to express plans for becoming a parent than childless employee women. However, they are *not* more likely than employees to say that they do not want any (more) children -- unless they already have many children. This is also true for the entrepreneurs and self-employed professionals.

These findings suggest that these women do not see laborer SE as flexible and convenient to become a parent or have another child. Childless laborer SE women perceive their employment status as less convenient for becoming a parent than employees, as predicted by the view that laborer self-employment is an insecure form of employment.<sup>8</sup>

#### *4.4.1 Summary of Findings for Women*

Taking stock of our descriptive findings, a clearer picture emerges. Laborer SE women have more children than employees, which remains consistent across model specifications and samples (e.g., couples vs. all women). Still, this finding is driven by women under 45, possibly because they have their children earlier than employee women. However, it is noteworthy that these women are less likely to plan to become parents than employed women and especially if they already have >2 children. Contrary to the notion that laborer self-employed women see their arrangement as advantageous for work-family balance, our findings suggest otherwise. Despite having more children, they do not express a stronger

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<sup>8</sup> Note that these specifications adjust for household income and wealth.

desire to become parents or have additional children. This disparity may be attributed to their considerably longer weekly work hours compared to employed women.

Self-employed professional women have fertility rates and intentions similar to employees, with slightly fewer children. Despite working fewer hours than other self-employed types, they work more than employees. These findings offer partial support for Goldin's hypothesis that Professional SE women may have poorer family outcomes than employees due to long work hours and agency issues (Goldin and Katz, 2016).

#### **4.5. Reverse Causality: Preferences for Self-Employment or Fertility**

Reverse causality is a key concern since both self-employment and fertility are choice variables. The arrival of a child in the household may increase the likelihood of becoming self-employed. For example, children could increase women's demand for flexibility and control over their work hours. Thus, some women transition into self-employment around childbirth (e.g., Joonas, 2016; Semykina 2018). Men may also transition into self-employment to increase their earnings capacity when their family size increases (Broussard, Chami and Hess, 2015). Thus, a higher number of children may lead to transitions into self-employment. These transitions may generate the associations we found in the previous analyses based on the cross-sectional data. To address reverse causality, we investigate the individuals' work history: more specifically, their transitions into and out of self-employment.

The SHIW data does not contain retrospective work histories of individuals to study these transitions using dynamic models. However, the data include a variable indicating whether an individual has worked "only as self-employed", "only as an employee", or "both" throughout his or her entire employment history. This variable is available in all cross-sectional waves except in 2014. Our rationale is that "people who have work experience in both" are more likely to have changed their employment type (e.g., switched to self-employment or switched to wage employment) due to childbirth. Therefore, we focus on the other two groups as their employment type, which never changed since they have first entered the labor market, cannot be a response to the birth of a child. Suppose we find that individuals who have always been self-employed have more children than those who have always been wage employees. In that case, we can plausibly claim that self-employed individuals prefer larger family sizes, *ceteris paribus*.

Thus, we estimate the following specification:

$$numkid_{it} = \alpha + \beta always\_self_{it} + \gamma switchers_{it} + X_i + \mu_t + \epsilon_{it} \quad (2)$$

where the dependent variable is the number of children ever born to individual  $i$  at time  $t$  and the regression is estimated for the subsample of people with at least one job experience. We are interested in estimating the coefficient  $\beta$  where  $always\_self_{it}$  is a dummy variable equal to one for individuals who have always been self-employed and zero otherwise; the comparison group includes those who have always been an employee, as we also control for having switched to self-employment or to wage employment ( $switchers_{it}$ ). We include all other covariates ( $X_i$ ) in equation (1) as well as, father's self-employment, industry, and year fixed effects. We use OLS to estimate equation (2). The estimates are reported in Table 4.

[Table 4 about here]

To provide a benchmark and comparison with our previous findings, in columns (1) and (3), we show the estimations for the baseline specification (equation 1) in Table 2 on this specific subsample of people with at least one job experience. Our baseline results are mostly confirmed in this subsample (except that the Laborer SE coefficients are not significant). This gives us confidence that we can focus on columns (2) and (4) of Table 4, where we compare those continuously self-employed and continuously employees.

Our estimates show that those who were “always self-employed” have on average more children than those who were “always an employee” regardless of the sex (about 0.07 for men and 0.12 for women). Although we report in Table 4 the results for the full sample controlling for flexible age, they are identical if we run these analyses only for the sample of women with completed fertility (>45). We find that these women have 0.13 more children than always employees (not reported). Men who switch between self-employment and wage employment have also more children than those who always remained an employee, which may indicate that some men switch because they become fathers. However, the coefficient size of switchers is smaller than those who have always been self-employed.

These results show that self-employment is not a reaction to an additional childbirth or planning to have a child. Instead, self-employed individuals may inherently differ in their preferences for number of children (or timing and hence, have more children) from employees.

## **5. The Causal Direction: Does self-employment *cause* more children?**

It is, of course, possible that people's preferences regarding family formation, fertility and work or family orientation could have been formed much before they participated in the labor

market. Those that self-select into self-employment (or entrepreneurship) right at the beginning of their careers might have other unobserved characteristics that may make them end up having more (or less) kids, such as risk behavior or optimism (see, e.g., Arpino and Bellami 2021 in Italy). These inherent and unobserved differences may account for the previous findings.

To address such potential endogeneity, we look for an exogenous source of variation in the likelihood of being self-employed. We use the father's self-employment as an instrument for the respondent's self-employment. It is well-established that fathers' self-employment or entrepreneurship are strong predictors of one's own self-employment or entrepreneurship (e.g., Dunn and Holtz-Eakin 1996; Hundley 2006; Sorensen 2007; Lindquist, Sol, and Van Praag, 2015). Because some of these studies on intergenerational transmission focus on father's entrepreneurship, we also use father being an "entrepreneur" instead of "self-employed" and report these findings in Table A6 in the appendix (which are qualitatively the same).

A potential problem with using father's self-employment (or entrepreneurship) status as an instrument is the violation of exclusion restriction: fathers' fertility (or preferences for more children) may directly and independently influence their children's fertility (Anderton et al., 1987; Booth 2009), a problem acknowledged by Noseleit (2014a).<sup>9</sup> Put differently, preferences for family size are also transmitted from fathers to children. Additionally, father's may also transmit "wealth" to their children to start their self-employed businesses, which may have a direct effect on fertility. To satisfy the exclusion restriction the transmission of father's fertility preferences and family wealth need to be conditioned. Luckily, the SHIW dataset uniquely allows us to construct a measure of the respondent's father's fertility using the information on "the respondent's number of siblings ever born". We then use it as a control variable in our IV specification. Under the conditional independence assumption, we argue that once the father's fertility preferences (measured by their fertility) and family wealth (excluding their current business assets) are controlled for, the self-employment of the father could be used as an instrument for the respondents' self-employment. Put differently, a father's self-employment could affect a respondent's fertility only through their transmission

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<sup>9</sup> An early version of Noseleit (2014) used "parent being self-employed" as an instrument. However, he explains in the published version that he abandoned this strategy because of the risk of fertility transmission from father to offspring, a point which a reviewer of his paper raised. The published version adopts a fertility instrument based on the sex composition of children, predicting the third child's birth.

of self-employment conditional on the father's fertility and respondent's wealth - excluding their current business assets -, which we include in our specification.

As a result, we first propose the following 2SLS specification:

$$Selfemployed_{it} = \alpha_{it} + \delta_1 x_{it} + \gamma_1 numsiblings_i + wealth_{it} + \theta father\ selfemployed_{it} + r_{it} \quad (3)$$

$$Numkids_{it} = \alpha_2 + \delta_2 x_{it} + \gamma_2 numsiblings_i + wealth_{it} + \beta \widehat{Selfemployed}_{it} + u_{it} \quad (4)$$

In both equations,  $it$  is the individual  $i$  ( $i=1, \dots, N$ ) at a specific survey wave  $t$  ( $t=1, \dots, T$ ) as earlier. Equation (3) is the first-stage equation, in which the endogenous variable, respondent's self-employment status ( $Selfemployed_{it}$ ) is regressed on the vector of exogenous controls  $x_{it}$ , the measure of father's fertility ( $numsiblings_i$ ) and respondent's wealth, and the instrument ( $father\ selfemployed_{it}$ ). The second stage (equation 4) uses the predicted rather than the actual value of the endogenous variable to predict the outcomes, along with the vector of controls,  $x_{it}$  and the measure of the father's self-employment. The random error terms are  $r_{it}$  and  $u_{it}$ . If the instrument is valid, the predicted value of the endogenous variable and the error term in the second-stage equation are uncorrelated, and the model produces consistent results. Because the father's number of children is not asked to spouse after 2008, we can only run these specifications for the waves up to 2008.

However, there is an additional problem with the linear IV specification above. Because our first-stage equation is binary (i.e., self-employed, or not), ignoring the non-linearity in the instrumental variable and running the standard 2SLS estimation is not advisable for various reasons, such as poor performance of OLS estimation, unreasonably large coefficients, and less precisely estimated coefficients than usual IV regression (Angrist and Pischke 2009; Huntington-Klein, 2021). There are two commonly used strategies to address this issue in practice. First, there is an easy implementation method of binary treatment into 2SLS strategy popularized by Wooldridge (2010; 2015), i.e., a generalized control function (CF) approach (with a probit link), which parsimoniously handles models with nonlinear endogenous explanatory variables (Wooldridge, 2010; 2015). According to this method, we first estimate the first stage using a probit model of the endogenous variable on the instruments as well as *all the controls*. Then, the predicted values obtained from this probit estimation are used directly *in place of the instruments* in the 2SLS (i.e., instead of directly inserting the predicted values in the second stage, which Hausman calls "forbidden regression"). Wooldridge shows that under this process nonlinearity does not bias the estimates anymore and we obtain more precise estimate than the typical 2SLS (Huntington-Klein, 2021). Following this method, we report estimates in Appendix table A6 to provide comparison and benchmark.

An alternative approach is the treatment effect regression, which avoids 2SLS entirely, and allows directly modelling the true binary nature of the data (Huntington-Klein, 2021). In this approach, we estimate the probit first stage and the linear second stage *simultaneously*, which allow the instrument to affect the endogenous variable as usual. (If our second stage were also binary, this approach would then be modified into the well-known bivariate-probit regression). (Huntington-Klein 2021). We prefer this approach also because it allows us to estimate the average treatment effect of self-employment on the total number of children directly, using Stata's *etregress* function. We report the estimates in Table 5 (next section).

## 5.1. Estimates

Table 5 reports our estimates from treatment effect regression approach using two step estimator. In Panel A, we report our main estimates and in Panel B, we report the first stage coefficients. Additionally, in Table A4, we instrument an individual's entrepreneurship with his/her father's entrepreneurship (instead of the broad category of self-employment) and report the same set of specifications. Each column reports a different model specification: 1) baseline specification, 2) a specification including log income and wealth from the previous year, and 3) a specification with spouse employment types (where the sample is a couple-sample).

[Table 5 about here]

We find that individuals who are self-employed because they have a self-employed father have more children across the board. Moreover, the coefficients are statistically significant and have reasonable sizes. For men, self-employment increases number of children approximately between 0.4 and 0.6 children, for women, between 0.5 and 0.6 children. As expected, these coefficients are slightly larger (see in Table 3), but in the same direction, than the OLS estimates and are plausible. Overall, the self-employment effect is robust to inclusion or exclusion of income and wealth, year fixed effects, age and education dummies, industry-fixed effects. Alternatively, when we adopt Wooldridge's (2010) easy implementation method, we find qualitatively similar results (see Table A4). Consistency between the estimates in these two approaches are reassuring.

Finally, we run the same set of specifications only for a subset of self-employed; "entrepreneurs", in line with several studies using only "father's entrepreneurship" to predict children's entrepreneurship (see Table A5 in the Appendix). For men, the effect of entrepreneurship on fertility is positive, statistically significant, and comparable in size with

models in Table 5 where we used all self-employed. For women, coefficient of interest in baseline specification is also similar in magnitude, positive and statistically significant, although estimates yield statistically non-significant results when we control for income and wealth and partner. These findings for women entrepreneurs (with father's entrepreneurship) might be due to the small sample size or could be interpreted that the overall SE effect is not driven by entrepreneur women but by their partners and family businesses.

The findings about women entrepreneurs seem consistent with Goldin and Katz's (2011) conclusion that business ownership is not particularly conducive for family formation for women unless accompanied by "workplace flexibility." However, their point is more about professional SE women rather than entrepreneurs in the USA.

## **6. Why do the self-employed people have more children?**

Previously, we established that individuals who are always self-employed on average have more children than employees and being self-employed (or entrepreneur) causes both men and women to have more kids. Next, we ask what mechanisms explain these findings. We propose two that might operate differently for men and women.

### **6.1. "Passing the Crown" Hypothesis**

One plausible channel is the "passing the crown" hypothesis. This is the idea that self-employed individuals prefer more children because having more children increases the chances of one of their children inheriting their business. In addition, a larger family size would also increase the possibility of employing family members as unpaid family business workers. Although the latter motive might be independently present even if there is no intention to pass the crown, these two motives are likely to co-occur in specific subgroups of entrepreneurs. For brevity, we call these two motives for children the "passing the crown" hypothesis. However, this hypothesis is less likely to explain the family size preferences of the laborer SE due to often lack of a formal business and professional SE where additional skills, credentials and licensing are often needed (i.e., pharmacist, dentist).

We investigate this mechanism by paying more attention to those more likely to bequeath business to their children within the sample of "entrepreneurs". We expect that outright owners of family businesses who employ more than one payroll worker should have higher incentives to bequeath their business to their children than all other categories of entrepreneurs, but especially those who own only a part of the business as a

shareholder/partner. Thus, we suggest that finding a positive correlation between the number of children and the types of entrepreneurship with higher degrees of business inheritability is evidence for this hypothesis. Our analysis already shows that within the categories of entrepreneurs, those working for a family business or owner of a family business tend to have more children (2.0 for male and 1.8 for females) compared to small employers (1.7 and 1.5, respectively), own account workers/craft workers (1.8 and 1.7, respectively) and working shareholders (1.6 and 1.4, respectively). We show this more formally in the models presented in Table 6 below.

[Table 6 about here]

Compared to those working for family business or owner of a family business, all the three categories of entrepreneurs tend to have fewer children. The coefficient is negative, larger, and statistically significant especially for partners/shareholders, which is the form of entrepreneurship where business is least inheritable. This group of entrepreneurs is also the least likely to rely on unpaid family workers. As a result, we conclude that the “passing the crown” hypothesis holds especially for men. For women, we also find a similarly negative coefficient (significant for entrepreneurs only) when we look at the baseline specification, but the coefficient turns statistically not significant once we include key demographic controls; the sample size shrinks considerably in this case.

## **6.2. Self-Employment for Women to Achieve Work-Life Balance.**

While the evidence shows all types of self-employment cause more children for men, the results for women seem to be driven by the laborer SE women in childbearing ages (although some evidence favors entrepreneur women, too). The literature on women has focused on self-employment as something women choose around childbirth to achieve better work and family life balance. If this is true, it is plausible that self-employment might also make women want to have further children. Put differently, the flexibility provided by self-employment might encourage women to have an additional child and reach their desired family size.

Our analyses on fertility intentions in section 4.4 already show that this is not the case in Italy. Laborer SE women (under 45) are less likely to consider becoming a parent or having an additional child than employee women, even though they are not more against the idea of having a child in the future. We also show that women who were always self-employed (who



did not transition into or out of self-employment) on average ended up having 0.12 more children than those who were always an employee.

Still, SHIW data makes it possible to test this hypothesis directly. Specifically, in 2004 and 2008, women who answered the fertility intentions question by saying that “No (we do not plan to have children in the future) but would have liked to have (more) children” were asked a follow-up question about the reasons for their reply. The respondent could choose a maximum of 2 out of 8 reasons listed, which include the following: “insufficient family income, work problems for the woman (hours, place of work and unstable employment), work problems for the man, housing limitations, lack of family members/relatives for childcare, unavailable formal childcare (or too expensive), care duties for other members of the family, and none of these reasons”.

Based on these questions, we create two indicators. The first one, called the “mismatch” indicator, equals 1 for women who express a desire to have (more) children but do not plan to do so in the future. It is 0 for those who either plan to have a child or are content with their family size. The mismatch measure indicates a discrepancy between desired and actual family size. We have this indicator for four waves (2002, 2004, 2006, and 2008). The second indicator is binary and applies to women with a “mismatch.” It measures whether they cited reasons related to the “incompatibility of children with their work and other caring duties,” such as work-related problems, lack of childcare support, or other family care duties. We expect laborer self-employed women to cite these reasons less often than employee women, indicating that the flexibility of self-employment contributes to their higher number of children. However, unfortunately, we have data for this indicator only in the 2004 and 2008 surveys.

We estimate different specifications by parity using the two indicators as dependent variables since the mismatch and incompatibility of children with work may vary for women with and without children. See our estimates in Table 7.

[Table 7 here]

In Panel (A), column 1 shows the estimates for the whole sample. Columns (2)-(4) show the estimates for the childless women, women with 1-2 children, and women with three or more children, respectively. Across all parity levels, laborer SE and entrepreneurs do not report any statistically significant mismatch between their desired and actual number of children

compared to employees. Strikingly, self-employed professional women are 0.16 percentage points less likely than employee women to report a mismatch when they are childless, and 0.07 percentage points less likely to report a mismatch when they have 1 or 2 children. In other words, they are clearly more content with the number of children than other groups.

In Panel (B), we check, using data from 2004 and 2008 waves, who among those reporting a mismatch cite the incompatibility with work and caring duties as the main reason. The sample size is small in these specifications. Column 5 shows baseline correlations, and the subsequent columns gradually include controls as defined before. Our preferred model is in column 7, which includes all controls, including income and wealth. Again, the key finding is that professional SE women are less likely than employee women to cite incompatibility with work and care duties (among those who report mismatch). However, other types of self-employed women are not statistically significantly different from wage earners. That is entrepreneur or laborer SE women are *not* less likely than employee women to cite the incompatibility with work and other caring duties as the reason for not having a (another) child.

The findings for laborer SE women align with our previous results. If flexibility were the primary reason for their higher number of children, they should be more likely to attribute having fewer children than desired to the incompatibility of work with caring duties. However, we do not observe this difference compared to employees (the coefficient is not statistically significant). Surprisingly, we do observe this pattern among professional SE women. This goes against expectations, as previous research on the USA suggests that they are less likely to have flexibility (Goldin 2016; Goldin and Katz 2001). However, considering their relatively lower weekly work hours in Italy compared to other self-employed women (though they still work somewhat more than employees), it is understandable that very few self-employed professional women, who report a mismatch, mention factors other than work and care incompatibility with children<sup>10</sup> as the main reason.

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<sup>10</sup> These findings align with Boeri et al. (2020), showing that in 2017, less than half of solo self-employed Italians were satisfied with their work hours. Approximately a quarter of solo self-employed and 44% of entrepreneurs expressed a desire to work fewer hours (with a third of solo self-employed wanting to work more hours). Family allowance and maternity policy were considered the most desirable benefits by around 25% of solo self-employed and entrepreneurs, followed by retirement benefits, which 44% of the solo self-employed sample named as most desirable. Other benefits like unemployment insurance and paid sick leave were cited less frequently, indicating that job insecurity is less of a concern for this group.

## 7. Summary of Findings and Discussion

We studied the relationship between self-employment types and fertility using Italian data spanning 1995 to 2014 with high-quality fertility measures and detailed information on self-employment types. Our comprehensive study is unique in its examination of both actual fertility and fertility intentions and in its comparison of sex differences, as previous research has focused exclusively on men or women or ignored the heterogeneity in self-employment.

Overall, we found no support for the conceptualization of self-employment as an insecure, unstable form of employment that discourages having children among Italian men. On the contrary, all self-employed men have higher fertility than employees. We also confirm that self-employment causes men to have more children, as demonstrated by various identification strategies. In other words, they have more children not because they choose self-employment to increase their earning capacity or control work schedules after becoming fathers. Rather, being self-employed appears to be a direct factor in their decision to have more children.

One reason could be that having (more) children may increase the likelihood of them eventually taking over the business, particularly after working as unpaid employees. As suggestive evidence, we find a correlation between the "inheritability" of self-employment type and the number of children. While this motivation could be weaker for laborer SE, lacking a formalized business, and professional SE, requiring credentials and licensing, both groups still have more children than employees. Many entrepreneur men start as laborer SE, increasing their desire to pass on the business to their offspring. Even after controlling for various factors, the number of children remains higher for entrepreneur men of all ages, supporting the idea that laborer SE serves as a steppingstone to entrepreneurship. Our findings align with similar US research by Broussard, Chami, and Hess (2015).

Our findings differ instead from previous studies on US women, whose choice of being self-employed has been linked with children, birth, and demand for flexibility. In the first instance, using naïve OLS estimations with fixed effects, we show a positive and statistically significant association between laborer SE and a higher number of children, driven by women under 45 (within the fertility window). This suggests that the explanations related to the demand for flexibility around childbirth might be plausible for Italian women, too. Moreover, the association disappears after most women complete their fertility, which is arguably, the period when women's demand for flexibility should be lower.

However, an explanation based on flexibility and work-life balance is less convincing in Italy because these women work an additional 8 hours per week on average than a typical employee. Thus, we conduct several further analyses and conclude that the transition to self-employment due to children and the demand for flexibility around childbirth *does not* explain why laborer SE women have more children in Italy.

To begin, we demonstrate that women who were always self-employed (of any kind) had more children than those who were always employees, consistent with men's results. This pattern holds for both older ( $>45$ ) and younger ( $\leq 45$ ) women, indicating that their self-employment is not solely motivated by a desire for flexibility due to childbirth. However, this alone may not suffice as evidence. There is a possibility that their preference for flexibility and a larger family existed before entering the labor market, leading them to choose self-employment as a convenient option. In this scenario, their demand for flexibility and unobserved preferences for children could have driven their decision to pursue self-employment.

We examine fertility intentions of young couples to assess whether self-employed women desire more children than employees. Surprisingly, they do not, regardless of parity. However, they are less likely to report a mismatch between desired and actual fertility, indicating satisfaction with their current number of children. Those who do mention a mismatch cite work and care duties' incompatibility with having children, similar to employees. This evidence suggests that these women do not necessarily perceive self-employment as notably flexible or convenient for having additional children.

Finally, our instrumental variable treatment effect regression confirms that self-employment causes women to have a higher number of children, similar to men. This indicates that the findings are not influenced by unobserved characteristics such as preferences for flexibility or large family size. Mechanisms affecting men are also likely applicable to women; for instance, female entrepreneurs tend to have more children than employed women. However, this association weakens when considering husbands' employment status, suggesting that female entrepreneurs often join their partner's family businesses as owners. Using "father being an entrepreneur" as the instrument further supports this idea, although in a smaller sample size. Thus, it is likely that other types of self-employment, such as laborer SE, might be driving the results in our main findings, as they tend to have their children earlier. Importantly, our results do not support the view of self-employment as an insecure and

precarious form of employment, commonly associated with fewer children in the Southern European context.

## **8. Conclusion**

Overall, our results imply that labor market policies that provide incentives to entrepreneurship or protection or benefits for self-employment may also have unintended effects on family size and fertility in a low fertility country like Italy. Should the share of self-employed be lower, Italy would probably suffer from an even lower level of fertility. Thus, treating self-employment only as an insecure and precarious form of employment may miss an essential role of this employment type for family formation. Future studies can delve more closely into how the benefits and incentives associated with different forms of self-employment differ across regions with varying degrees of childcare availability and expenses, as well as labor market circumstances.

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**Table 1: Descriptive Statistics**

Variable	Employees		Professional SE				Entrepreneurs				Laborer SE					
	Men (N=24,319)		Women (N=18,775)		Men (N=1,826)		Women (N=737)		Men (N=1,984)		Women (N=780)		Men (N=4,825)		Women (N=2,342)	
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
N. kids	1.49	1.11	1.35	1.06	1.48	1.16	1.15	1.15	1.68	1.03	1.51	1.07	1.67	1.14	1.59	1.07
Father Self Employed	0.17		0.18		0.31		0.32		0.37		0.34		0.36		0.31	
Age	43.88	9.14	42.36	9.07	46.59	10.15	41.05	8.60	43.79	9.88	46.28	9.68	46.47	10.08	44.73	9.85
<i>Education:</i>																
None or primary	0.10		0.06		0.01		0.01		0.09		0.08		0.18		0.20	
Middle school	0.46		0.35		0.09		0.06		0.45		0.43		0.53		0.46	
High school	0.32		0.40		0.43		0.26		0.39		0.41		0.25		0.26	
Higher education	0.12		0.19		0.47		0.67		0.07		0.08		0.04		0.08	
<i>Marital Stat:</i>																
Married	0.84		0.73		0.80		0.63		0.86		0.77		0.86		0.78	
Single	0.12		0.14		0.13		0.26		0.08		0.12		0.09		0.11	
Separated	0.04		0.10		0.06		0.09		0.05		0.07		0.04		0.07	
Widow	0.00		0.03		0.01		0.02		0.01		0.03		0.01		0.03	
<i>Born Abroad:</i>																
	0.09		0.09		0.02		0.05		0.03		0.05		0.04		0.07	
<i>Geographical Area:</i>																
North	0.49		0.58		0.56		0.54		0.55		0.56		0.49		0.47	
Center	0.20		0.21		0.21		0.30		0.22		0.21		0.19		0.23	
South & Islands	0.32		0.21		0.23		0.16		0.23		0.22		0.32		0.30	
<i>City size:</i>																
0-20.000 inh.	0.45		0.46		0.39		0.33		0.52		0.57		0.52		0.55	
20.000-40.000 inh.	0.14		0.13		0.13		0.10		0.14		0.13		0.16		0.14	
40.000-500.000 inh.	0.27		0.28		0.32		0.29		0.24		0.20		0.24		0.21	
500 inh. and over	0.14		0.13		0.17		0.28		0.10		0.10		0.09		0.10	

*Table continued in the next page.*

Variable	Employees				Professional SE				Entrepreneurs				Laborer SE			
	Men (N=24,319)		Women (N=18,775)		Men (N=1,826)		Women (N=737)		Men (N=1,984)		Women (N=780)		Men (N=4,825)		Women (N=2,342)	
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
<i>Industry:</i>																
Agriculture	0.05		0.04		0.02		0.01		0.09		0.07		0.1		0.1	
Manufacturing and Energy	0.41		0.18		0.24		0.07		0.39		0.2		0.32		0.12	
Retail, maintenance	0.09		0.13		0.07		0.06		0.31		0.51		0.39		0.5	
Transport	0.06		0.02		0.02		0.02		0.05		0.02		0.06		0.01	
Monetary financial	0.03		0.03		0.12		0.07		0.01		0.02		0.01		0.01	
Public admin	0.35		0.59		0.53		0.77		0.16		0.18		0.13		0.26	
H. income	31,995	19,991	36,773	22,932	54,758	40,784	53,708	37,702	50,313	52,598	52,266	49,536	33,143	28,899	34,755	25,186
H. income ex. Business	34,263	19,275	36,878	20,138	24,943	24,721	25,195	24,307	19,543	20,577	21,393	23,567	14,654	14,644	18,615	17,086
H. business income	1,055	6,292	3,335	13,976	34,901	32,368	32,755	31,025	34,695	48,071	34,748	41,338	22,339	26,579	20,383	21,862
Wealth	176,390	333,811	224,382	430,064	491,384	725,127	446,886	805,950	684,794	1,175,759	694,197	1,300,191	326,960	545,976	351,929	512,564
<i># of hours worked</i>																
Mean (Median)	40.05 (40)	7.59	33.86 (36)	9.44	44.62 (45)	13.44	36.14 (40)	13.24	49.49 (50)	12.99	42.37 (42)	14.97	47.90 (48)	13.84	40.98 (40)	15.76
Variable	Men (N= 21,379)		Women (N=14,502)		Men (N= 1,546)		Women (N= 535)		Men (N=1,755)		Women (N=639)		Men (N=4,278)		Women (N=1,911)	
Spouse Employee	0.47		0.71		0.46		0.53		0.31		0.31		0.25		0.32	
Spouse Entrepreneur	0.01		0.04		0.01		0.05		0.14		0.38		0.02		0.04	
Spouse Laborer SE	0.03		0.07		0.04		0.08		0.05		0.11		0.19		0.41	
Spouse Profess. SE	0.01		0.05		0.11		0.29		0.02		0.03		0.01		0.03	
Spouse Out of LF	0.48		0.13		0.38		0.05		0.49		0.17		0.53		0.2	

Note: Authors' calculation from the SHIW (waves 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, and 2014). Sample weights included. *Entrepreneurs* include small employer, working shareholder/partner, own-account worker that own 100% of the business and employ more than one payroll employee and owner of the family business that own more than 50% of the business and employ more than one employee. *Laborer SE* includes own-account worker/craft worker, owner or member of family business, contingent worker on own account and small employer that owns 100% of the business and employs no one. *Professional SE* includes member of a profession. *Household income* is  $Y = YL$  (labor Income) +  $YT$  (transfers,

pensions and other) + YM (business income) + YC (capital income). *Household income excluding business* is YL (labor income) + YT (transfers; pensions and other) + YC (capital income). *Household business income* is YM (business income). *Household net worth*: Wealth is net wealth, i.e., the sum of household's liquid assets, financial assets, property and business, net of household liabilities. Income and wealth are deflated and measured at prices of 2010.

**Table 2: Number of children and self-employment type; reduced form OLS estimates.**

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Ref Cat: Employees</i>								
Entrepreneurs	0.162*** (0.027)	0.131*** (0.028)	0.131*** (0.028)	0.103*** (0.031)	0.129** (0.054)	0.093* (0.054)	0.092* (0.055)	0.043 (0.067)
Laborer SE	0.071*** (0.023)	0.061*** (0.023)	0.061*** (0.023)	0.062** (0.026)	0.076*** (0.028)	0.071*** (0.027)	0.071** (0.028)	0.071** (0.033)
Professional SE	0.084** (0.034)	0.067** (0.034)	0.067** (0.034)	0.081** (0.038)	0.068 (0.048)	0.040 (0.048)	0.040 (0.048)	0.028 (0.063)
Out of Labour Force	-0.181*** (0.040)	-0.157*** (0.041)	-0.157*** (0.041)	-0.205*** (0.045)	0.036 (0.051)	0.066 (0.051)	0.066 (0.051)	0.041 (0.053)
Father Self Employed		0.068*** (0.016)	0.068*** (0.016)	0.075*** (0.017)		0.083*** (0.015)	0.083*** (0.015)	0.079*** (0.017)
Ln (H. income)		0.073*** (0.013)	0.073*** (0.014)	0.095*** (0.017)		0.107*** (0.012)	0.107*** (0.013)	0.078*** (0.017)
Ln (wealth)			0.001 (0.029)	0.014 (0.031)			0.001 (0.027)	0.033 (0.031)
<i>Ref Cat: Spouse Employee</i>								
Spouse Entrepreneur				0.018 (0.063)				0.111*** (0.031)
Spouse Laborer SE				0.062** (0.031)				0.054** (0.025)
Spouse Professional SE				0.021 (0.064)				0.061 (0.038)
Spouse Out of Lab Force				0.185*** (0.016)				-0.021 (0.021)
# of obs. (person x years)	48,542	48,542	48,542	42,087	55,710	55,710	55,710	42,052
R-squared	0.294	0.296	0.296	0.174	0.256	0.260	0.260	0.175

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample weights included. Repeated cross-section for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014. *Entrepreneurs* include small employers; working shareholder/partners; own-account worker that own 100% of the business and employ more than one payroll employee; owner of the family business that own more than 50% of the business and employ >1 employee. *Laborer SE* includes own-account worker/craft worker, owner or member of family business, contingent worker on own account and small employer that owns 100% of the business and employs no one. *Professional SE* includes member of a profession. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included in *all* specifications are: full set of age dummies (20-68), education dummies, and six cohort dummies (), marital status, born abroad, city size and the geographical area (North, Centre and South) indicators. When taking log of income and wealth, we added the minimum income to eliminate negative incomes. [Wealth is net wealth and can take negative values (Appendix 1)].

**Table 3. Fertility Intentions of partnered women <46 years old. (LPM)**

	(A) Yes, I (we) plan to have (more) children in the future				(B) No, I (we) don't want any (more) children			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	all parity	Num kids==0	Num kids==1 or 2	Num kids>=3	all parity	Num kids==0	Num kids==1 or 2	Num kids>=3
<i>Ref Cat.: Employees</i>								
Entrepreneur	-0.018 (0.046)	-0.120 (0.098)	0.049 (0.050)	-0.103* (0.055)	0.041 (0.056)	0.128 (0.086)	-0.025 (0.066)	0.172** (0.086)
Laborer SE	-0.073*** (0.028)	-0.251*** (0.083)	0.013 (0.033)	-0.098** (0.039)	0.083** (0.039)	-0.034 (0.051)	0.023 (0.051)	0.159** (0.066)
Professional SE	0.095 (0.059)	0.043 (0.105)	0.129* (0.071)	-0.081* (0.048)	-0.037 (0.052)	-0.017 (0.057)	0.001 (0.066)	-0.281 (0.176)
Out of lab. force	-0.012 (0.040)	0.012 (0.113)	0.031 (0.048)	0.005 (0.024)	0.036 (0.050)	-0.019 (0.072)	-0.035 (0.061)	0.077 (0.096)
Observations	5,496	1,109	3,729	658	5,496	1,109	3,729	658
R-squared	0.168	0.213	0.129	0.195	0.229	0.350	0.166	0.123

Note: Estimates from the Linear Probability Model (LPM) are reported. Robust standard errors in parentheses. Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included in all specifications are: age dummies, education dummies, marital status indicator, income and wealth. Outcome variable for columns (1) - (4) is a dummy variable equal to 1 for “yes” and 0 for “no”. Outcome variable for columns (5) - (8) is a dummy variable equal to 1 for “No, I don't want any (more) children” and 0 “otherwise”. These analyses use waves 2002, 2004, 2006 and 2008 of the SHIW. The question of “Do you plan to have (more) children in the future” is asked only to couples in which the woman is under 46 years of age. Survey provides only one response per couple.

**Table 4. Reverse causality: Work History and Preference for Family Size**

	MEN		WOMEN	
	(1)	(2)	(3)	(4)
<i>Ref Cat: Always been an Employee</i>				
Always been Self Employed		0.070*** (0.026)		0.121*** (0.030)
Switchers		0.059*** (0.019)		-0.003 (0.024)
<i>Ref Cat: Employees</i>				
Entrepreneurs	0.107*** (0.034)		0.094* (0.049)	
Laborer SE	0.044 (0.027)		0.116*** (0.033)	
Professional SE	0.082** (0.040)		0.037 (0.055)	
Out of Lab Force	- 0.234*** (0.050)		-0.130** (0.061)	
Father Self Employed	0.102*** (0.019)	0.098*** (0.019)	0.118*** (0.020)	0.115*** (0.020)
Born Abroad	0.200*** (0.034)	0.201*** (0.034)	0.087*** (0.033)	0.087*** (0.033)
Ln (H. income)	- 0.059*** (0.016)	-0.058*** (0.016)	0.036** (0.017)	0.038** (0.017)
Ln (wealth)	0.005 (0.034)	0.006 (0.034)	-0.002 (0.035)	0.004 (0.035)
Observations	36,302	36,302	29,105	29,105
R-squared	0.261	0.261	0.256	0.256

Note: Models are estimated using OLS. Specifications in column 1 and 3 are exactly the same as the model specifications 2 and 6 in Table 2, estimated on the subsample of people with at least one job experience. Robust standard errors in parentheses. Sample weights included. Work history variable was only available for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, and 2012. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. We include year fixed-effects and industry fixed-effects in all specifications. Other controls are: age dummies, education dummies, marital status indicator. Always self-employed men include 16% current entrepreneurs, 43% current laborer SE, 18% current Professional SE, and the rest are currently out of labor force (retirees, homemakers, etc). This distribution for women is similar (10% entrepreneurs, 33% laborer SE and 12% professional SE, the remaining half of those always self-employed are currently out of labor force). About 12% of men and 9% of women have responded being always self-employed in their work life.

**Table 5. Testing for Endogeneity of Self-employment (Treatment Effect Regression)**

<i>Panel A: Second Stage</i>						
	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
Second stage:	Number of children					
Self-Employed	0.46*** (0.089)	0.35*** (0.096)	0.57*** (0.10)	0.46*** (0.12)	0.28** (0.12)	0.63*** (0.13)
Ln (H. income)		0.096*** (0.015)			0.14*** (0.019)	
Ln (wealth)		-0.10* (0.057)			-0.022 (0.054)	
Spouse SE			-0.13*** (0.046)			-0.11** (0.041)
Spouse Out of Lab Force			0.15*** (0.017)			-0.0015 (0.027)
<i>Panel B First Stage:</i>						
Father Self-Employed	0.45*** (0.021)	0.34*** (0.022)	0.40*** (0.022)	0.37*** (0.028)	0.26*** (0.029)	0.24*** (0.033)
$\hat{\tau}$	-0.24	-0.18	-0.31	-0.26	-0.17	-0.36
$\sigma$	0.95	0.94	0.97	0.90	0.89	0.92
Observations	23,954	23,954	21,356	15,806	15,806	12,582

Note: The table reports the estimates from two stage treatment effect regression. Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The sample includes individuals in the labor force for the years 1995, 1998, 2000, 2002, 2004, 2006 and 2008. The other survey waves were not used because father's number of children was only available in these waves. Other controls are: age, education and year dummies, marital status, city size, sector of activity, born abroad, father's number of children. In columns (1)-(3) self-employed men include 6% entrepreneurs, 15% laborer SE, 5% Professional SE. For women the distribution is similar (3% entrepreneurs, 12% laborer SE and 3% professional SE). We estimate these results using Stata's `etregress` command and two step function.

**Table 6. “Passing the crown”: # of children of the different types of Entrepreneurs.**

	Men			Women	
	(1)	(2)	(3)	(1)	(2)
<i>Ref. Cat.: Owner or member of family business</i>					
Small employer	-0.251*	-0.150	-0.125	-0.218	-0.125
	(0.143)	(0.139)	(0.135)	(0.175)	(0.164)
Own-account worker/craft worker	-0.248	-0.218	-0.185	-0.048	0.006
	(0.178)	(0.174)	(0.159)	(0.200)	(0.181)
Working shareholder	-0.395***	-0.257*	-0.232*	-0.314***	-0.193
	(0.139)	(0.136)	(0.133)	(0.121)	(0.119)
Age	no	yes	yes	no	yes
Education	no	yes	yes	no	yes
Ln (Income)	no	no	yes	no	no
Ln (Wealth)	no	no	yes	no	no
Other controls	no	no	yes	no	no
Observations	1985	1985	1985	778	778
R-squared	0.008	0.115	0.333	0.008	0.141

Note: Robust standard errors in parentheses from the OLS Estimates. The models are run only for the subsample of entrepreneurs Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Other controls are: marital status, migration status, area of residence, city size, industry fixed-effects and year fixed-effects. The sample includes all years. The sample for men currently includes 44% small employer, 9% own-account worker/craft worker, 44% working shareholder. For women the distribution is similar (38% small employer, 6% own-account worker/craft worker, 49% working shareholder).

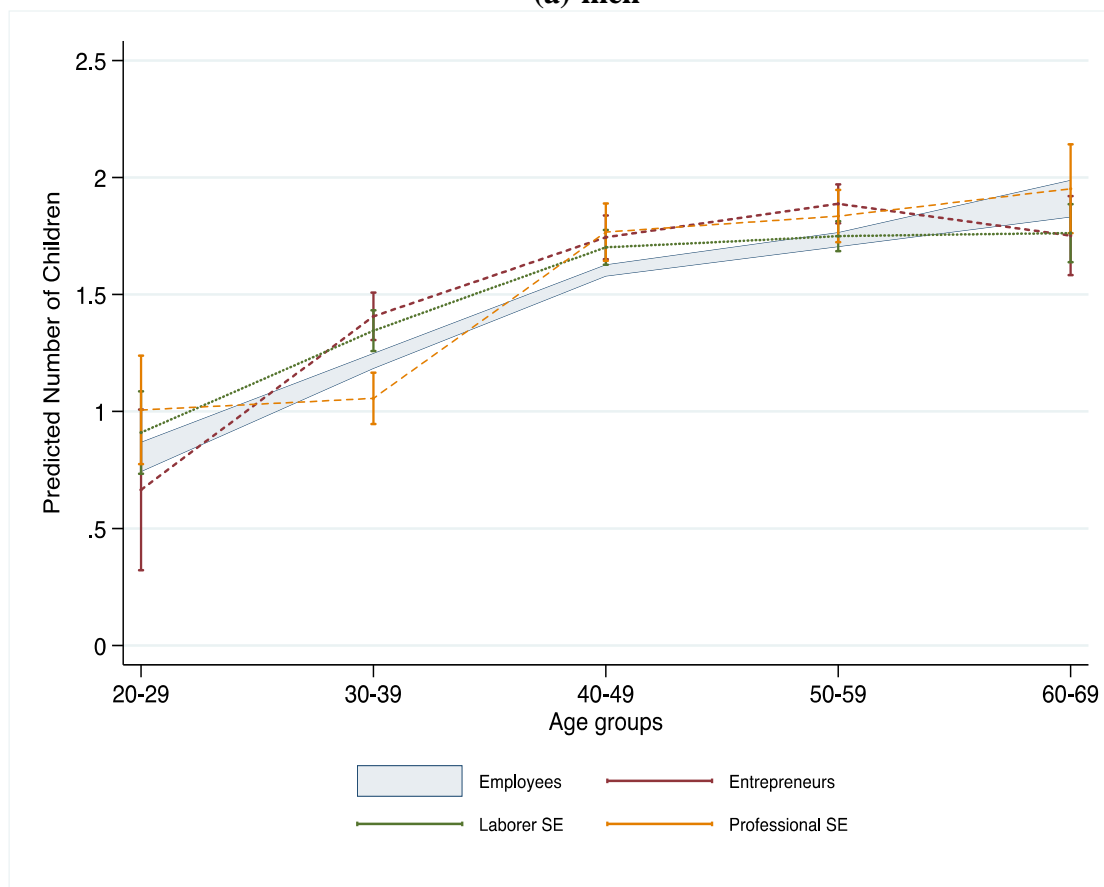


**Table 7. Testing for the work-life balance hypothesis (For women<46)**

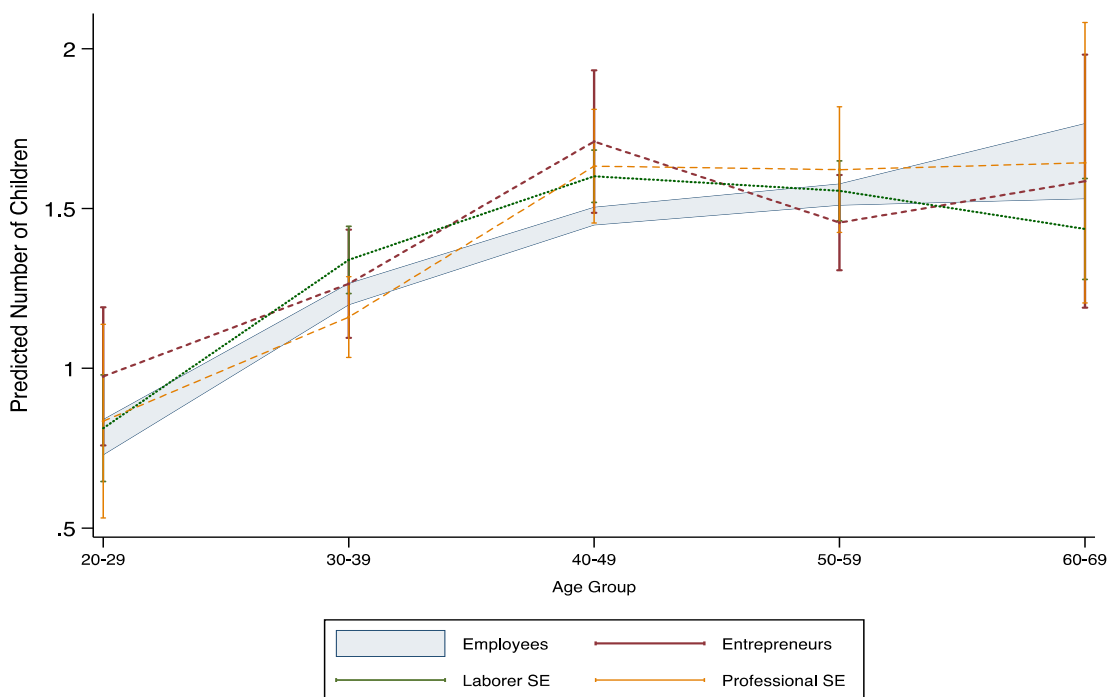
	(A) Mismatch: “Would have liked to have (more) children but could not do” (2002-2008)				(B) Reasons for mismatch: “incompatible with work and other care duties” (2004-08)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	all parity	Numkids =0	Numkids =1 or 2	Numkids >=3	No other controls	With age and education	Full controls
<i>Ref Cat.: Employees</i>							
Entrepreneur	-0.037 (0.049)	0.078 (0.191)	-0.060** (0.031)	0.027 (0.032)	-0.141 (0.178)	-0.192 (0.230)	-0.093 (0.223)
Laborer SE	-0.038 (0.030)	-0.031 (0.086)	-0.037 (0.036)	-0.010 (0.033)	-0.108 (0.123)	-0.138 (0.127)	-0.020 (0.166)
Professional SE	-0.112*** (0.031)	-0.163** (0.077)	-0.077** (0.032)	0.017 (0.034)	-0.287*** (0.051)	-0.271*** (0.070)	-0.242* (0.140)
Out of lab. Force	-0.041 (0.052)		-0.023 (0.052)	0.028 (0.024)	-0.094 (0.064)	-0.074 (0.071)	0.253*** (0.091)
Observations	2,479	512	1,662	305	309	309	308
R-squared	0.061	0.242	0.071	0.113	0.016	0.072	0.180

Note: Robust standard errors in parentheses. Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. We include year fixed-effects and industry fixed-effects in specifications (1)-(4). Other controls included in (1)-(4) and (7) are: age dummies, education dummies, marital status indicator, income and wealth. Industry fixed effects are controlled also in column (7). Outcome variable for columns (1)-(4) is a dummy variable equal to 1 for reporting a mismatch between the actual and desired for number of children. Outcome variable for columns (5)-(7) is a dummy variable equal to 1 for having reported incompatibility with work or caring reasons as a reason for the mismatch between actual and desired number of children; the sample is restricted to the years 2004 and 2008 and only women (<46) because there is only one answer per couple reported by women. Column (1) includes 2% entrepreneurs, 5% laborer SE, 2% Professional SE, 44% out labor force (retirees, homemakers, etc). Columns (5)-(7) include 1% entrepreneurs, 3% laborer SE, 2% Professional SE, 41% out labor force (retirees, homemakers, etc).

**Figure 1: Predicted number of children by employment type**  
**(a) men**



**(b) women**



Note: Predicted values are estimated using a modified version of specification 3 and 7 of Table 2 (employment types interacted with age), respectively.

## Online Appendix

### 1. Variable definitions

*Number of children* Question: Did you have any children (still alive) *not residing* with you on 31 December? If yes, how many? The question, which refers to the number of children ever born (and not only to the children at home at the moment of the interview), is available from 1995 to 2014. We then combined the information provided by this question with the information about the number of children currently *residing* in the household to construct our measure of *number of children ever born to individual*.

*Occupation* Question: Main occupation. Responses: (1) blue-collar, (2) office worker, (3) school teacher, (4) junior/middle manager, (5) senior manager, (6) member of profession, (7) small employer, (8) own-account worker/craft worker, (9) owner or member of family business, (10) working shareholder/partner, (11) seeking first job, (12) unemployed, (13) homemaker, (14) independent means, (15) retired worker, (16) pensioner (disability/survivor's pension/old-age welfare benefits), (17) student, (18) pre-school-age child, (19) voluntary worker, (20) contingent worker on own account, (999) other. We defined: *out of the labor force* (11) seeking first job, (12) unemployed, (13) homemaker, (14) independent means, (15) retired worker, (16) pensioner (disability/survivor's pension/old-age welfare benefits), (17) student, (18) pre-school-age child, (19) voluntary worker, (999) other; *professional SE* (6) member of profession; *entrepreneurs* (7) small employer, (10) working shareholder/partner; *laborer SE* (8) own-account worker/craft worker, (9) owner or member of family business, (20) contingent worker on own account.

Additionally, if the respondent is the owner of family business, owns 100% of the business and has more than one payroll employee, we classify him as an entrepreneur and not as a laborer; if the respondent is an own account worker, owns more than 50% of the firm and has more than one payroll employee, he/she is an entrepreneur. Furthermore, if the respondent is a small employer, that owns 100% of the business and employs no one, he/she is classified as a laborer (and not as an entrepreneur).

*Father Self-employed* Question: What was the employment status of your parents when they were your age? (If parent was retired or deceased at that age, refer to the time preceding retirement or death. If parent had more than one job, indicate the main one). Responses: (1) blue-collar worker, (2) office worker, (3) school teacher, (4) junior/middle manager, (5)

senior manager, (6) member of a profession, (7) small employer, (8) own-account worker/craft worker, (9) not employed. The variable *Father SE* was constructed as a dummy variable equal to one for the occupations (6), (7) and (8). We also constructed a dummy variable for *father professional* (6), *father entrepreneur* (7) and *father laborer* (8). Unfortunately, the variables related to the share of the business and number of employees was not available for the father of the respondent.

*Father's number of siblings:* the question is asked to the household head and spouse/partner "Did you have any siblings (still alive) not residing with you?" If yes, how many?

*Education* None or primary education (up to 5 years of education), middle school (8 years of education), high school (up to 13 years of education), higher education (more than 13 years of education).

*Birth Cohorts:* We define seven birth cohorts, roughly each corresponding to 10-12% of our sample, with around 6 years; i.e. born before 1939; between 1940 and 1946; 1947 and 1952; 1953 and 1956; 1959 and 1965; 1965 and 1971 and after 1971.

*Marital status* Question: Marital status. Responses: (1) Married (includes couples living together), (2) never married, (3) separated and divorced (4) widowed.

*Born Abroad* Question: place of birth. Responses: If in Italy please enter province code; if abroad please enter country code.

*Geographical Area* Question: residence of the household. Responses: North (Piemonte, Valle D'Aosta, Liguria, Lombardia, Trentino, Friuli, Veneto, Emilia-Romagna), Centre (Marche, Umbria, Toscana, Lazio), South & Isles (Abruzzi, Molise, Campania, Basilicata, Puglia, Calabria, Sicilia, Sardegna).

*Sector of occupation* Question: Main sector of occupation. Responses: (1) agriculture, (2) industry and construction, (3) retail, maintenance, accommodation and restaurants, (4) transport and communication, (5) monetary financial and insurance mediation, (6) public administration or public and private services.

*Labor earnings* Question: How much did you earn from your labor activity net of all taxes and contributions? This question is asked to each member of the household, whether it is employed or self-employed. *Household income* is  $Y = YL$  (labor income) +  $YT$  (transfers;

pensions and other) + YM (business income) + YC (capital income).  $\text{Ln}(\text{H. income}) = \text{Ln}(Y)$ . *Household income excluding business* is YL (labor income) + YT (transfers; pensions and other) + YC (capital income);  $\text{Ln}(\text{H. income ex. business}) = \text{Ln}(YL+YT+YC+\text{minimum})$ , i.e., we add the minimum value to get rid of negative incomes. *Household business income* is YM (business income);  $\text{Ln}(\text{H. Business Income}) = \text{Ln}(YM + \text{minimum})$ , i.e., we add the minimum value to eliminate negative incomes. Variables are deflated and measured at prices of 2010.

*Household net worth*: Sum of household's liquid assets (checking accounts, saving accounts, money market accounts, certificates of deposits), financial assets (stocks, government bonds, other bonds), property and business, net of household liabilities (debt owned on credit cards, on car loans, other forms of consumer debt, and mortgages on houses, properties, and additions). Variables are deflated and measured at prices of 2010.

*Number of hours worked*: Question How many hours did you work on average per week in 2008, including paid and unpaid overtime?

*Employment status of the spouse*: employment status of the wife (if married) or of the partner (if cohabitant).

*Fertility intentions*: We consider waves 2002-2008. Couples in which the woman is under 46 years of age were asked if they were planning to have (more) children in the future. In the 2002 survey, possible answers were "yes," "no," "don't know." In the subsequent waves the set of possible answers was extended to include: "yes," "not now," "we will think about it later," "no we do not want any more children," "we are happy with the number of children that we have," and "no, but we would have liked to have (more) children." In 2008 a further choice was added: "No, I do not want children". In 2002 the question on childbearing intentions was asked to all women under 50 years of age. In 2008 the question was put to all women aged 18 to 45 years, instead of couples. In 2004 and 2008, all women that reported that they would have liked to have (more) children answered a question about the reasons for not having (further) children. In 2008, possible answers included: insufficient income, incompatibility with work, an unsuitable home, lack of regular help from relatives, no nursery schools nearby or schools that were too expensive, the need to care for other relatives, the absence of a partner to have children with, a lack of agreement with the partner about the number of children, and biological/physiological reasons.

## 2. Additional Tables and Figures

**Table A1. Poisson Estimations for Number of Children of Ever Born**

VARIABLES	MEN				WOMEN			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Ref Cat.: Employees</i>								
Entrepreneur	0.176*** (0.027)	0.143*** (0.027)	0.135*** (0.028)	0.114*** (0.032)	0.158*** (0.060)	0.118* (0.061)	0.112* (0.061)	0.061 (0.072)
Laborer SE	0.076*** (0.023)	0.065*** (0.023)	0.061*** (0.023)	0.070*** (0.026)	0.114*** (0.031)	0.106*** (0.031)	0.103*** (0.031)	0.105*** (0.034)
Professional SE	0.104*** (0.037)	0.088** (0.037)	0.085** (0.037)	0.093** (0.040)	0.055 (0.069)	0.028 (0.069)	0.026 (0.069)	0.022 (0.077)
Out of lab. force	-0.152*** (0.037)	-0.133*** (0.037)	-0.133*** (0.037)	-0.170*** (0.040)	0.064 (0.045)	0.094** (0.044)	0.094** (0.044)	0.061 (0.046)
Father Self. Empl.		0.066*** (0.015)	0.064*** (0.015)	0.070*** (0.017)		0.079*** (0.015)	0.078*** (0.015)	0.071*** (0.017)
Ln (H. income)		0.076*** (0.013)	0.070*** (0.015)	0.101*** (0.017)		0.117*** (0.012)	0.112*** (0.014)	0.085*** (0.016)
Ln (wealth)			0.032 (0.028)	0.047 (0.030)			0.025 (0.027)	0.068** (0.030)
<i>Ref Cat.: Spouse Employee</i>								
Spouse Entrepreneur				0.030 (0.070)				0.107*** (0.031)
Spouse Laborer SE				0.090*** (0.033)				0.053** (0.024)
Spouse Professional SE				0.010 (0.078)				0.083** (0.041)
Spouse Out of lab force				0.213*** (0.017)				-0.012 (0.019)
Observations	48,542	48,542	48,542	42,087	55,710	55,710	55,710	42,052

Note: Marginal effects. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample weights included. Repeated cross-section for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014. *Entrepreneurs* include small employer, working shareholder/partner, own-account worker that own 100% of the business and employ more than one payroll employee and owner of the family business that own more than 50% of the business and employ more than one employee. *Laborer SE* includes own-account worker/craft worker, owner or member of family business, contingent worker on own account and small employer that owns 100% of the business and employs no one. *Professional SE* includes member of a profession. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included in all specifications are: age dummies, education dummies, marital status, born abroad, city size and the geographical area (North, Centre and South) indicators. When taking ln(income), we added the minimum income to eliminate negative incomes. Wealth is net wealth and can take negative values.

**Table A2: Number of children and self-employment type with age breakdown; OLS estimates**

VARIABLES	MEN		WOMEN				MEN		WOMEN			
	Panel A) Age 45 or less						Panel B) Age>45					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Ref. Cat.: Employees</i>												
Entrepreneurs	0.179*** (0.042)	0.128*** (0.043)	0.083* (0.049)	0.207** (0.084)	0.139 (0.085)	0.096 (0.104)	0.155*** (0.036)	0.128*** (0.037)	0.119*** (0.041)	0.029 (0.058)	0.009 (0.059)	-0.030 (0.068)
Laborer SE	0.137*** (0.034)	0.108*** (0.035)	0.093** (0.041)	0.115*** (0.038)	0.088** (0.038)	0.097** (0.045)	0.027 (0.030)	0.024 (0.030)	0.041 (0.033)	0.045 (0.041)	0.057 (0.041)	0.051 (0.047)
Professional SE	0.033 (0.043)	0.011 (0.043)	0.006 (0.051)	0.115* (0.059)	0.077 (0.058)	0.121 (0.077)	0.148*** (0.050)	0.133*** (0.050)	0.143*** (0.055)	-0.030 (0.084)	-0.052 (0.085)	-0.170 (0.111)
Out of Lab Force	-0.114* (0.067)	-0.109 (0.068)		0.017 (0.072)	0.043 (0.072)	-0.009 (0.071)	-0.192*** (0.052)	-0.171*** (0.053)	-0.235*** (0.057)	0.052 (0.072)	0.083 (0.072)	0.082 (0.078)
Father Self. Empl.		0.070*** (0.026)	0.085*** (0.029)		0.100*** (0.022)	0.103*** (0.025)		0.062*** (0.020)	0.064*** (0.021)		0.068*** (0.022)	0.053** (0.024)
Ln (H. income)		-0.005 (0.025)	0.039 (0.029)		0.051*** (0.017)	0.050** (0.024)		0.126*** (0.019)	0.150*** (0.022)		0.170*** (0.020)	0.145*** (0.025)
Ln (wealth)		0.145** (0.057)	0.201*** (0.064)		0.188*** (0.045)	0.195*** (0.052)		-0.063* (0.035)	-0.063* (0.036)		-0.118*** (0.035)	-0.076* (0.040)
<i>Ref. Cat.: Spouse Employee</i>												
Spouse Entrepreneur			0.047 (0.121)			0.067 (0.043)			-0.002 (0.054)			0.144*** (0.044)
Spouse Laborer SE			0.150*** (0.055)			0.043 (0.034)			0.029 (0.038)			0.062* (0.035)
Spouse Professional SE			0.092 (0.084)			0.008 (0.047)			-0.050 (0.101)			0.161** (0.063)
Spouse Out of lab force			0.233*** (0.027)			0.039 (0.046)			0.171*** (0.020)			-0.004 (0.024)
Observations	16,499	16,499	13,771	21,253	21,253	18,234	32,043	32,043	28,316	34,457	34,457	23,818
R-squared	0.321	0.323	0.183	0.304	0.308	0.203	0.199	0.203	0.096	0.175	0.180	0.090

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample weights included. Repeated cross-section for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included are listed in Table 1.

**Table A3: Number of children and self-employment type with North-South breakdown; OLS estimates**

VARIABLES	NORTH						SOUTH					
	MEN			WOMEN			MEN			WOMEN		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Entrepreneurs	0.201*** (0.037)	0.140*** (0.039)	0.107** (0.043)	0.183*** (0.053)	0.111** (0.054)	0.048 (0.065)	0.177*** (0.064)	0.159** (0.064)	0.129* (0.068)	0.064 (0.180)	0.037 (0.182)	-0.023 (0.217)
Laborer SE	0.109*** (0.032)	0.090*** (0.033)	0.095** (0.038)	0.148*** (0.038)	0.136*** (0.039)	0.120** (0.048)	0.053 (0.043)	0.053 (0.044)	0.061 (0.047)	-0.012 (0.062)	-0.005 (0.062)	-0.037 (0.068)
Professional SE	0.093** (0.047)	0.060 (0.048)	0.078 (0.055)	0.072 (0.064)	0.029 (0.064)	-0.009 (0.085)	0.124** (0.060)	0.123** (0.060)	0.121* (0.068)	0.197* (0.108)	0.183* (0.108)	0.240* (0.132)
Out of Lab Force	-0.013 (0.054)	0.048 (0.054)	0.020 (0.061)	0.068 (0.085)	0.118 (0.085)	0.090 (0.090)	-0.058 (0.059)	-0.025 (0.061)	0.209*** (0.070)	0.457*** (0.113)	0.500*** (0.113)	0.566*** (0.137)
Father Self. Empl.		0.098*** (0.023)	0.090*** (0.025)		0.120*** (0.022)	0.096*** (0.024)		0.014 (0.031)	0.036 (0.032)		0.023 (0.029)	0.039 (0.032)
Ln (H. income)		0.122*** (0.019)	0.192*** (0.026)		0.163*** (0.021)	0.158*** (0.026)		0.061** (0.024)	0.063** (0.027)		0.096*** (0.022)	0.068** (0.027)
Ln (wealth)		0.030 (0.037)	0.005 (0.043)		0.013 (0.038)	0.027 (0.043)		-0.015 (0.067)	0.030 (0.068)		0.022 (0.061)	0.106 (0.066)
<i>Ref. Cat.: Spouse Employee</i>												
Spouse Entrepreneur			0.034 (0.065)			0.116*** (0.042)			0.042 (0.218)			0.112* (0.064)
Spouse Laborer SE			0.123*** (0.048)			0.090** (0.035)			0.006 (0.061)			0.043 (0.046)
Spouse Professional SE			-0.019 (0.090)			0.080 (0.055)			0.153 (0.129)			0.087 (0.069)
Spouse Out of lab force			0.274*** (0.023)			-0.028 (0.031)			0.174*** (0.032)			0.022 (0.036)
Observations	21,625	21,625	18,231	24,702	24,702	18,215	16,934	16,934	15,231	19,566	19,566	15,221
R-squared	0.270	0.276	0.144	0.221	0.229	0.145	0.263	0.264	0.142	0.232	0.234	0.144

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample weights included. Repeated cross-section for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included are listed in Table 1.



**Table A4. Testing for Endogeneity of Self-employment (Woolridge Method)**

	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
	Number of children					
Self-Employed	0.090*** (0.021)	0.072*** (0.022)	0.085*** (0.023)	0.074*** (0.027)	0.046* (0.027)	0.037 (0.034)
Constant	0.947*** (0.063)	-1.152** (0.471)	0.653*** (0.068)	1.088*** (0.079)	-2.060*** (0.513)	0.888*** (0.082)
Other controls	yes	yes	yes	yes	yes	yes
Ln (Income)+ Ln (wealth)	no	yes	yes	no	yes	yes
Spouse controls	no	no	yes	no	no	yes
Observations	23,954	23,954	21,356	15,806	15,806	12,582
R-squared	0.323	0.325	0.215	0.314	0.318	0.218
F	323.8	309.1	107.2	191.8	184.7	66.49

Note: Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The sample includes individuals in the labor force for the years 1995, 1998, 2000, 2002, 2004, 2006 and 2008. Other controls are: age, education and year dummies, marital status, city size, sector of activity, born abroad, father's number of children. In columns (1)-(3) self-employed men include currently 6% entrepreneurs, 15% laborer SE, 5% Professional SE. For women the distribution is similar (3% entrepreneurs, 12% laborer SE and 3% professional SE).

**Table A5. Testing for Endogeneity of “Entrepreneur” (treatment effect with two step estimation)**

<i>Panel A: Second Stage</i>	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
	Number of children					
Self-Employed	0.57*** (0.16)	0.44*** (0.13)	0.37** (0.16)	0.55** (0.26)	0.21 (0.18)	-0.051 (0.18)
Ln (H. income)		0.080*** (0.014)			0.12*** (0.018)	
Ln (wealth)		-0.030 (0.041)			0.049 (0.040)	
Spouse Entrepreneur			-0.090 (0.088)			0.18*** (0.063)
Spouse Laborer SE			0.099*** (0.030)			0.026 (0.026)
Spouse Professional SE			-0.0050 (0.053)			0.082** (0.036)
Spouse Out of lab force			0.19*** (0.015)			0.020 (0.026)
<i>Panel B First Stage:</i>						
Father Self-Employed	0.83*** (0.071)	0.58*** (0.076)	0.85*** (0.078)	0.43*** (0.12)	0.060 (0.13)	-0.11 (0.17)
$\hat{\tau}$	-0.24	-0.20	-0.14	-0.26	-0.12	0.020
$\sigma$	0.94	0.94	0.95	0.89	0.89	0.90
Observations	23,954	23,954	21,356	15,806	15,806	12,582

Note: Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The sample includes individuals in the labor force for the years 1995, 1998, 2000, 2002, 2004, 2006 and 2008. Other controls are: age, education and year dummies, marital status, city size, sector of activity, born abroad, father’s number of children. In columns (1)-(3) self-employed men include currently 6% entrepreneurs, 15% laborer SE, 5% Professional SE. For women the distribution is similar (3% entrepreneurs, 12% laborer SE and 3% professional SE).

**Table A6. Testing for Endogeneity of “Entrepreneur” (Woolridge Method)**

<i>Panel A: Second Stage</i>	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
Second stage:	Number of children					
Self-Employed	0.136*** (0.034)	0.087** (0.035)	0.124*** (0.037)	0.062 (0.045)	-0.009 (0.046)	-0.028 (0.057)
Ln (Income)		0.085*** (0.023)			0.097*** (0.025)	
Ln (wealth)		0.108*** (0.038)			0.179*** (0.041)	
Spouse Entrepreneur			0.041 (0.060)			0.244*** (0.050)
Spouse Laborer SE			0.110*** (0.040)			0.074* (0.038)
Spouse Professional SE			0.030 (0.087)			0.107** (0.051)
Spouse Out of lab force			0.180*** (0.020)			-0.022 (0.038)
Constant	0.970*** (0.062)	-1.324*** (0.465)	0.663*** (0.068)	1.111*** (0.078)	-2.268*** (0.511)	0.907*** (0.083)
Observations	23,954	23,954	21,356	15,806	15,806	12,582
R-squared	0.322	0.325	0.214	0.313	0.318	0.218

Note: Sample weights included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The sample includes individuals in the labor force for the years 1995, 1998, 2000, 2002, 2004, 2006 and 2008. Other controls are: age, education and year dummies, marital status, city size, sector of activity, born abroad, father’s number of children. In columns (1)-(3) self-employed men include currently 6% entrepreneurs, 15% laborer SE, 5% Professional SE. For women the distribution is similar (3% entrepreneurs, 12% laborer SE and 3% professional SE).

**Table A7: Number of children and self-employment type for those working more than 20 hours per week; OLS estimates.**

	Men		Women	
	(1)	(2)	(3)	(4)
<i>Ref Cat: Employees</i>				
Entrepreneurs	0.132*** (0.029)	0.109*** (0.032)	0.077* (0.045)	0.023 (0.053)
Laborer SE	0.072*** (0.023)	0.072*** (0.026)	0.100*** (0.029)	0.100*** (0.034)
Professional SE	0.069** (0.034)	0.085** (0.039)	0.000 (0.051)	-0.022 (0.069)
Out of Lab Force	-0.134*** (0.042)	0.193*** (0.016)	0.065 (0.053)	0.029 (0.055)
Father Self Empl.	0.070*** (0.016)	0.076*** (0.017)	0.081*** (0.016)	0.076*** (0.018)
Ln (H. income)	0.085*** (0.014)	0.114*** (0.017)	0.121*** (0.014)	0.099*** (0.017)
Ln (wealth)	0.013 (0.029)	0.025 (0.031)	0.001 (0.028)	0.042 (0.031)
<i>Ref Cat: Spouse Employee</i>				
Spouse Entrepreneur		0.024 (0.066)		0.100*** (0.031)
Spouse Laborer SE		0.078** (0.032)		0.045* (0.024)
Spouse Professional SE		-0.002 (0.065)		0.075* (0.040)
Spouse Out of Lab Force		0.193*** (0.016)		-0.014 (0.021)
# of obs.(person x years)	47,557	41,256	53,726	40,433
R-squared	0.297	0.174	0.262	0.178

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Sample weights included. Repeated cross-section for the years 1995, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014. *Entrepreneurs* include small employer, working shareholder/partner, own-account worker that own 100% of the business and employ more than one payroll employee and owner of the family business that own more than 50% of the business and employ more than one employee. *Laborer SE* includes own-account worker/craft worker, owner or member of family business, contingent worker on own account and small employer that owns 100% of the business and employs no one. *Professional SE* includes member of a profession. We include year fixed-effects and industry fixed-effects in all specifications. Other controls included in all specifications are: age dummies, education dummies, marital status, born abroad, city size and the geographical area (North, Centre and South) indicators. We added the minimum income and wealth to eliminate negative incomes and wealth. Wealth is net wealth and can take negative values.

