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Intergenerational correlation of self-employment in Western Europe

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ABSTRACT

Existing research has focused on factors explaining why individuals become self-employed. Self-employment may represent a significant proportion of total employment in many countries, and the intergenerational correlation of self-employment has been used as an explanatory factor, although findings differ across countries, methods, and strategies. Using data from the European Union Statistics on Income and Living Conditions (EU-SILC), we analyze the existence of intergenerational correlations of self-employment in nine European countries, using information on the current self-employment status of respondents, and that of their parents when the respondents were 14 years old. We show that this correlation is statistically significant in general terms. Furthermore, the transmission is especially important between fathers and sons. We also contribute reporting differences in these correlations across countries. The transmission is partially explained by a country's legal context for self-employment, and by its entrepreneurial culture, with the former being more important than the latter.

1. Introduction

This paper explores the intergenerational correlation of self-employment in nine European countries. The study of intergenerational transmission investigates how and to what extent certain factors are transmitted from parents to children, beyond pure selection theories. Two major factors – human capital and education – have been found to be transmitted from parents to children (Black et al., 2005). Other authors have studied the transmission of human development (Francesconi and Heckman, 2016), occupational practices (Doepke and Zilibotti, 2017), wealth (Bom, 2019), earnings and work hours (Altonji and Dunn, 2000; Black and Devereux, 2011), and migration decisions (Kim and Lee, 2019).

Understanding the intergenerational transmission of socio-economic conditions and attitudes is of key importance for planners and policy makers. For example, policies to reduce poverty and inequality of opportunity could be more efficiently implemented if the determining factors were known to be transmitted from parents to children. Hence, intergenerational transmission is of special importance for children, given that the process determines future socio-economic behaviors (Kim and Lee, 2019). Despite research suggesting that intergenerational transmission of self-employment status exists, the results are mixed, and the underlying reasons remain unclear (Colombier and Masclet, 2008; Vladasel et al., 2021). Furthermore, such transmission varies significantly across countries (children of self-employed parents are between 30% and 300% more likely to be self-employed themselves), and methodologies are limited to studies of single countries (Parker, 2009; Blumberg and Pfann, 2016; Ferrando-Latorre et al., 2019). To date, the transmission of self-employment has not been studied in a multi-country setting, using comparable, homogeneous, and harmonized data.

Within this framework, we first consider the relationship between the self-employment status of individuals, and that of their parents when those individuals were 14 years old. In doing so, we use the 2011 module on Intergenerational Transmission of the European Union Statistics on Income and Living Conditions data, for Austria, Belgium, France, Greece, Luxembourg, Netherlands, Spain, Sweden, and the UK. Our results show a strong and statistically significant intergenerational correlation of self-employment, as individuals who had a self-employed parent have a 10.8% increase in the probability of being self-employed themselves. Furthermore, this intergenerational correlation is especially important between sons and their fathers, since sons whose father was self-employed in the past have a 15.7% increase in the probability of being self-employed, relative to those whose father was not self-employed. Second, we investigate cross-country differences in the intergenerational correlations of self-employment between sons and fathers, and find that these correlations range from increases of 5.5% in the probability of

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being self-employed in Sweden, to increases of 19.5% and 19.0% in such probability in Belgium and Luxembourg, respectively. Our results indicate that differences in these correlations are partially driven by country differences in the legal conditions for business, and the cultural context of self-employment, with the former being more important than the latter.

Several authors have analyzed the intergenerational transmission of employment - and unemployment - in a wide range of countries, and recent research has focused on the intergenerational transmission of self-employment status, although the literature remains scarce (Galassi et al., 2019). The transmission of self-employment status is of special interest in Europe (Porras-Arena and Martín-Román, 2019), given that during the recent economic crisis the levels of unemployment have been extraordinarily high. In such a context, self-employment has emerged as a useful tool to boost economic growth and happiness (Velilla et al., 2018; Yin et al., 2019; Zhao et al., 2020; Jian et al., 2021). Despite research suggesting that intergenerational transmission of self-employment status exists, the results are mixed, and the channels remain unclear (Colombier and Masclet, 2008; Vladasel et al., 2021). Some authors argue that "first generation" self-employed, not having been influenced by self-employed parents, may value different factors than do "second generation" self-employed workers. Some of those factors are business experience, values, and managerial skills (Sorensen, 2007; Gauly, 2017). Other authors have analyzed whether individuals become entrepreneurs, or are born to be so, but the results are mixed across countries and studies (Nicolaou et al., 2008; Nicolaou and Shane, 2010; Matthews et al., 2011; Lindquist et al., 2015; Gauly, 2017).

The existing research shows different contexts in which self-employment may be transmitted from parents to children (Fritsch et al., 2015), including business inheritance (Fairlie and Robb, 2007; Schafer and Talavera, 2009; Wang, 2010; Bhasi et al., 2020), managerial and entrepreneurial skills (Colombier and Masclet, 2008), culture (Laspita et al., 2012), and parental aspirations (Levie and Autio, 2013). Other factors that may determine self-employment and its intergenerational transmission are a country's legal framework, social networks, marital sorting, the transmission of specific cultural values regarding self-employment, and the transmission of contacts (Sorensen, 2007; Bosma et al., 2020).[1]

We contribute to the literature in several ways. First, we show that individuals have a greater probability of being self-employed if their parents were self-employed when those individuals were 14 years old, with the correlation being independent of specific country conditions, such as unemployment rates, nest-leaving behaviors, or female workforce participation. Furthermore, we document gender differences in these intergenerational correlations, both in terms of children's gender, and the gender of the parent who was self-employed in the past. These differences may help to explain variations in the transmission of self-employment reported by prior research, which find increases of between 30% and 300% in the probability of becoming self-employed (Colombier and Masclet, 2008; Parker, 2009; Blumberg and Pfann, 2016; Ferrando-Latorre et al., 2019; Vladasel et al., 2021). We conclude that the increase is around 15.7% between fathers and sons, net of individual, parent, household, and country characteristics, which suggests that prior analyses tend to overestimate the intergenerational transmission of self-employment.

Second, we analyze country differences in the transmission of self-employment from fathers to their sons, and offer a cross-country comparison of these intergenerational correlations for nine European economies. This is a contribution to the literature, since most prior analyses focus on single countries and use different data and methods, thus not allowing for quantitatively comparable results. We report country differences, which partially explain the divergence among prior studies, but these differences range between 19.5% and 5.5%, smaller than differences reported by previous authors (Parker, 2009). Finally, as the intergenerational correlation of self-employment does not hold homogeneously for the nine analyzed countries, we open new lines of explanatory research, since country differences may be driven by a range of factors, such as personality traits or human capital (Li and Goetz, 2019). We consider whether cross-country differences arise from differences in in-country business conditions and culture, and the results suggest that both the business conditions of countries and the culture of self-employment partially explain these differences.

The remainder of the paper is organized as follows. Sections 2 and 3 present the data used throughout the analysis, and the empirical strategy, respectively. Section 4 shows the main estimates and discusses the results. Section 5 discusses potential channels for the transmission of self-employment, and Section 6 concludes.

2. Data and variables

We use data from the European Union Statistics on Income and Living Conditions (EU-SILC) Special Module on Intergenerational Transmission of Disadvantages (ITD), for the year 2011, and for the following countries: Austria, Belgium, France, Greece, Luxembourg, the Netherlands, Spain, Sweden, and the UK.[2] The main purpose of the special module is to collect information about household and parent characteristics when respondents were 14 years old, for individuals between 25 and 59 years old. Fathers (mothers) refer to the individual that the respondent considers their father (mother), which in general refers to the biological father (mother). However, if respondents consider someone else to be the father (mother), the responses should refer to that individual. Unfortunately, there is no information about whether information refers to the biological father (mother) or not.

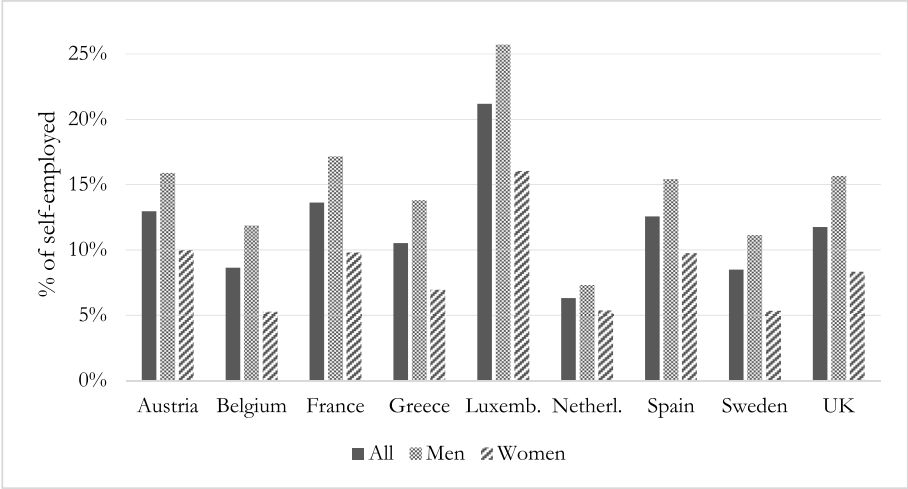
The employment status of individuals is defined in the EU-SILC data in terms of the question: "labour information/basic labour information on current activity and on current job". The possible categories are: 1) Employee (full-time); 2) Employee (part-time); 3) Self-employed worker (full-time, including family workers); 4) Self-employed worker (part-time, including family workers); 5) Unemployed; 6) Pupil, student, in training or in unpaid work experience; 7) In retirement, early retirement or given up business; 8) Permanently disabled or unfit to work; 9) In compulsory military service or community service; 10) Fulfilling domestic tasks and care responsibilities; 11) Other inactive person. We study employees from categories (1) and (2), and self-employed workers from categories (3) and (4). As we focus on the employment status of employed workers (e.g., whether they are self-employed workers, or employees), all other respondents are omitted from the sample.

The sample is also restricted to individuals who completed the ITD (aged between 25 and 59 years old) for whom there is information about their parents when the respondent was 14 years old.[3] The sample combines individuals with information for both the mother and the father, for the father, and for the mother. For each respondent, we then define a

[1] Social values have been found to be transmitted from parents to their offspring (see Cemalcilar et al., 2018, for a recent review), while, to the best of our knowledge, the intergenerational transmission of specific values regarding self-employment has not been studied.

[2] Access to the data has been granted by Contract RPP 119/2018 for the period 01/01/2018-30/06/2023. The sample is restricted to countries with information on the variables of interest. Countries from Eastern Europe (see https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions) have been eliminated to focus only on Western Europe. Since developing economies have lower rates of female labor participation, different self-employment behaviors, more inequality in self-employment, and different gender and identity roles, we have left the study of Eastern Europe for future research (Naudé, 2010; Mondragón-Vélez and Peña, 2010; Terjesen and Amorós, 2010).

[3] There are no historic employment records of children or parents. Therefore, both children and parents could have been self-employed before or after the recorded year, and the estimated results may be biased downwards (i.e., we are estimating the lower bound of the relationship).



Note: The sample (EU-SILC 2011) is restricted to employed individuals who filled-in the ITD, who are not students, retired, or disabled. Percentage computed as the number of self-employed workers over the number of employed (employees plus self-employed) workers, using sample weights. Countries sorted alphabetically.

Fig. 1. Self-employment rates, by country.

dummy variable that takes value 1 if the parents were cohabiting when the respondent was 14 years old, 0 otherwise, so that we partially control for household structure. It is important to note that we refer to respondents of the sample as "sons" or "daughters", to avoid confusion of wording. Thus, individuals in the sample (i.e., survey respondents) are always the children, and "parents" (i.e., "fathers" or "mothers") are always the parents of those children.

Sample restrictions leave us with information for 64,294 respondents (31,859 sons and 32,435 daughters), including 58,743 records of fathers, and 63,292 records of mothers; 15.60% individuals in the sample (10,030 respondents) correspond to self-employed children, with the remaining 84.40% being employee children. Furthermore, 5930 respondents live in Austria, 5152 in Belgium, 12,957 in France, 3334 in Greece, 18,145 in Luxembourg, 6276 in the Netherlands, 5012 in Spain, 1972 in Sweden, and 5516 in the UK.

Fig. 1 shows the percentage of self-employed respondents in our country samples, by country, and by country and gender. The percentage of (son and daughter) self-employed workers differs across countries. The country with the highest percentage of self-employed is Luxembourg, at 21.2%. This corresponds to 25.7% of the male and 16.0% of the female workers being self-employed in that country. Self-employment levels are below 15% in the remaining countries, although among males this percentage is between 15% and 17% in Austria, France, Spain and the UK. The percentage of female self-employed workers, on the other hand, is below 10% in all the countries but Luxembourg. The country with the lowest rate of self-employment is the Netherlands, where only 6.3% of workers are self-employed (7.3% of the males and 5.3% of the females).

The EU-SILC data allows us to define several socio-demographic characteristics of children (i.e., of respondents). This includes gender, measured with a dummy variable ("male") that takes value 1 for men, and 0 for women, and age, measured in years (and age squared, divided by 10). As several authors have documented that women's and men's self-employment rates may differ, and that becoming self-employed is correlated with age, it is important to control for these variables (Fairlie and Robb, 2007; Levesque and Minniti, 2006; Minniti and Nardone, 2007; Minniti, 2009; Artz, 2016; Coduras et al., 2018; Velilla et al., 2018). We also define the maximum level of education achieved by respondents, which has been found to determine self-employment decisions (Minniti, 2009; Levie and Autio, 2013; Kyrö, 2015). Education is measured according to the International Standard Classification of Education. From this information, we use two educational dummy variables: "secondary education", which takes value 1 for those who have a secondary but non-compulsory level of formal education (0 otherwise), and "University education", which takes value 1 if individuals have a University education. We define certain variables at the household level, including the total household disposable income (measured in Euros per year, divided by 1000), since household finances are related to self-employment decisions (Molina et al., 2016; Yin et al., 2019), and the marital status of respondents, measured by a dummy that identifies those who have never been married over their life cycle (value 1, 0 otherwise) and the number of children present in the household, to control for household structure (see Molina, 2020, for a review). We also define, from the ITD, the financial situation of the household when the respondent was aged 14, taking values from 1 ("very bad") to 6 ("very good"), since income effects may affect self-employment decisions (Schafer et al., 2011; Xiang et al., 2021). Summary statistics of variables are shown in Table 1.

Given that the EU-SILC also includes information about respondents' occupations, and self-employment concentrates differentially across occupations (see Fig. A1 in the Appendix), we define occupation dummies for the survey respondents (i.e., for the children of analyzed households). The occupational classification included in the EU-SILC identifies the following occupation groups: 0) Armed forces; 1) Managers; 2) Professionals; 3) Technicians and associate professionals; 4) Clerical support; 5) Service and sales; 6) Agriculture, forestry, and fishery; 7) Craft and related trades; 8) Plant, machine operators, assemblers; and 9) Elementary occupations. It is important to control for occupation when analyzing self-employment decisions and, in particular, the transmission of self-employment (Aldrich and Kim, 2007; Fairlie and Robb, 2007; Sorensen, 2007; Colombier and Masclet, 2008; Andersson and Hammarstedt, 2011).

The information available about parents in the special module includes age, education level, employment status, and the number of children in the year in which the respondent was aged 14. However, parents' education, and the number of children in the household when respondents were 14 are likely to be endogenous (Del Rey and Lopez-Garcia, 2016). Thus, we only consider parents' age (and age squared) when the children were 14 years old as control variables in the

Table 1
Summary statistics.

Variables	Employees		Self-employed		Diff.
	Mean	S.D.	Mean	S.D.	*p*-value
Individual/household variables					
Being male	0.485	0.500	0.644	0.479	(<0.001)
Age	41.985	9.545	43.867	8.971	(<0.001)
Never married	0.307	0.461	0.261	0.439	(<0.001)
Secondary ed.	0.408	0.492	0.399	0.490	(0.596)
University ed.	0.338	0.473	0.306	0.461	(<0.001)
No. of children	2.250	1.939	2.154	1.947	(<0.001)
Household income (/1000)	40.229	30.103	38.820	43.063	(0.426)
Financial situation	3.942	1.102	3.962	1.073	(0.006)
Father variables					
Age	45.072	5.973	45.463	5.990	(<0.001)
Employee	0.780	0.415	0.602	0.490	(<0.001)
Self-employed	0.188	0.390	0.367	0.482	(<0.001)
No. fathers	49,417		9326		
Mother variables					
Age	41.976	5.735	42.136	5.685	(0.009)
Employee	0.389	0.488	0.292	0.455	(<0.001)
Self-employed	0.067	0.249	0.142	0.349	(<0.001)
No. mothers	53,395		9897		
N. individuals (children)	54,264		10,030		

Note: The sample (EU-SILC, 2011) is restricted to employed individuals who filled-in the ITD, who are not students, retired, or disabled. Difference *p*-values computed according to *t*-type tests.

empirical analysis.[4] To partially control for differences depending on the number of parents when children were 14 years old, we also include a dummy variable that takes value 1 if both parents were present in the household (i.e., if parents were cohabiting when children were 14), 0 otherwise. The employment status of the parents when the child was aged 14, which is the explanatory variable of interest, is measured by the same eleven categories as those used to measure respondents' employment status. Thus, we can straightforwardly identify those children whose father or mother was self-employed. Summary statistics of parents' variables are shown in Table 1. For employee (self-employed) children, 78.0% (60.2%) of their fathers were employed, and 18.8% (36.7%) were self-employed. The remaining parents were non-working. For mothers, the figures are qualitatively similar, as 38.9% (29.2%) of the mothers of employee (self-employed) children were employees, while 6.7% (14.2%) of mothers were self-employed workers when the children were 14 years old. These differences, which are statistically significant at standard levels, suggest a significant intergenerational correlation of self-employment.

2.1. Country-varying factors

We define control variables at the country level, to account for factors that may be affecting the relationship between children's and parents' self-employment status. To that end, we first consider the unemployment rates of countries in the year 2011, and the same rates when respondents were 14 years old, taken from the European Data Warehouse of the World Health Organization. Self-employment and unemployment rates have been found to be correlated (Tervo, 2006; Congregado et al., 2010); self-employment may be an attractive strategy for unemployed individuals, and so controlling for unemployment levels may partially account for this relationship.

We also control for the fertility levels of countries in the year 2011, and when respondents were 14 years old. Bellido and Marcén (2019) find that business activity and fertility rates are correlated in a significant way, after controlling for several country factors. Other authors have also found that fertility is related to several economic variables (Browning et al., 2014). Thus, to partially control for the potential impact of a country's fertility level on business and self-employment conditions, we include in the estimates the fertility index. We also include the nest-leaving behavior of children in the sample countries in the year 2011. Nest-leaving decisions may be correlated with the employment and self-employment decisions of individuals (Giuliano, 2007), and they affect the early careers of workers and individual domains, which may be correlated with business careers and with parent-child relationships (Mendonça and Fontaine, 2013). The nest-leaving behavior is measured using an index from EUROSTAT, defined as the "share of young adults aged 18–34 living with their parents, by age and sex".

Female labor force participation may also be a factor affecting the self-employment decisions of the young. To the extent that there are cross-country differences in female labor-force participation rates, it could be that in countries with relatively higher rates, children (especially daughters) have a higher likelihood of employment, and thus may have a greater desire to work, either as employed or self-employed. Hence, cross-country differences in female labor-force participation rates may potentially affect the intergenerational correlation of self-employment between parents and their children. Farré and Vella (2013) found that the transmission of mothers' attitudes to their children is related to women's labor supply. Female labor-force participation rates are measured for countries in the year 2011 and when respondents were 14 years old, with data from Eurostat, defined as "labor force participation rate, female (% of female population ages 15+)". This factor is available annually since the 1980s, but only by decade between 1960 and 1979, and the closest dates are selected for these decades.

We control for cross-country differences in social norms regarding the role of women in society. Employment decisions may be influenced by social norms and culture (Vollebergh et al., 2001; Levine and Hoffner, 2006), and the social norms regarding working women have evolved in recent years, along with increases in female labor-force participation, affecting individual employment and self-employment decisions (Campaña et al., 2018; Hwang et al., 2019). We compute the average values of variables representing these social norms, considering the following notions: "women need children in order to be fulfilled", "woman single parent, no stable relationship with man", and "important in marriage: share household chores". These variables are computed at the country level, and taken from the European Values Surveys for the years 1981, 1990, 1999, and 2008.[5]

3. Empirical strategy

We first regress the current self-employment status of respondents (i.e., of children), in terms of whether they had a self-employed parent when they were 14 years old. The main explanatory variable of this baseline analysis is a dummy variable that takes value 1 if the mother or the father were self-employed, 0 otherwise. Then, this baseline analysis allows us to study the overall intergenerational correlation of self-employment. Assume that i represents the reference individual of household j, living in country c. The following equation is estimated using OLS:

$$S_{ijc} = \beta_0 + \beta_1 S^p_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \delta_c + \varepsilon_{ijc}, \quad (1)$$

where S_{ijc} is the dummy variable indicating whether individual i in household j of country c is self-employed (value 1; 0 if employee) at the time of the interview; S^p_{ijc} is the main explanatory (dummy) variable

[4] Although the data includes information on parents' occupation, it does not include information on whether respondents have inherited the parents' business if parents were self-employed. Then, we are unable to study business inheritance as a channel for the transmission of self-employment.

[5] Estimates including social norms computed from the 2008 wave only are robust, and are available upon request.

indicating whether a parent of individual i in household j of country c was self-employed (value 1; 0 otherwise) when the respondent was 14 years old; X_{ijc} represents the socio-demographic factors of individual i in household j of country c, X_{jc} represents characteristics of household j of country c, and δ_c is country fixed effects. Finally, ε_{ijc} represents the error term. Errors are clustered at the country level in all the estimates.

Equation (1) is first estimated for all respondents (i.e., all children) in the sample, regardless of their gender. However, there is an extensive literature documenting gender differences in self-employment behaviors (see Minniti, 2009; Artz, 2016), so we next estimate Equation (1) separately for sons and daughters, to determine whether the overall transmission of self-employment varies by gender. Similarly, and considering that the transmission of certain socio-economic attributes has been found to be gender-specific (Colombier and Masclet, 2008; Wang, 2010; Farré and Vella, 2013; Lo et al., 2020), we study whether the transmission of self-employment differs between fathers and sons, mothers and sons, fathers and daughters, and mothers and daughters. In doing so, we estimate the following equations:

$$S_{ijc} = \beta_0 + \beta_1 S^f_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \delta_c + \varepsilon_{ijc}, \quad (2)$$

$$S_{ijc} = \beta_0 + \beta_1 S^m_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \delta_c + \varepsilon_{ijc}, \quad (3)$$

where S^f_{ijc} is now a dummy variable that takes value 1 if the father of individual i in household j of country c was self-employed when the respondent was 14 years old (0 otherwise), and S^m_{ijc} takes value 1 if the mother of individual i in household j of country c was self-employed when the respondent was 14 years old (0 otherwise). The remaining variables are defined analogously to Equation (1). Equations (2) and (3) are estimated separately for male and female respondents (i.e., for sons and daughters), to analyze potential heterogeneous effects in terms of the gender of children and parents.

The interpretation of the main coefficient, β_1, in Equations (1)–(3), is similar to that of the well-known intergenerational elasticities (Solon, 2002; Black and Devereux, 2011; Giménez-Nadal et al., 2021). For instance, it captures intergenerational mobility in a simple way through a single estimated parameter. In the case of Equation (1), the parameter represents the change in the probability of children being self-employed at the current date (relative to employees), conditional on a parent (i.e., the mother or the father) being self-employed in the past.[6] In Equations (2) and (3), coefficient β_1 should be interpreted analogously, but referring only to whether the father was self-employed in the past in Equation (2), or whether the mother was self-employed in the past in Equation (3).

Next, we analyze the robustness of the results in the presence of additional explanatory variables, relative to the baseline estimates. For the sake of simplicity, and considering that the female labor market has traditionally suffered from potential endogeneity (Attanasio et al., 2008; Blundell et al., 2016; Kumar, 2016; Theloudis, 2021), we focus for the remaining analyses on the intergenerational correlation of self-employment between fathers and sons. We then re-estimate Equation (2), restricted to sons, as follows:

$$S_{ijc} = \beta_0 + \beta_1 S^f_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \beta_4 X^f_{ijc} + \delta_c + \varepsilon_{ijc}, \quad (4)$$

where X^f_{ijc} represents the characteristics of the father of individual i in household j of country c.[7] We also include specific country characteristics that may be correlated with individuals' and parents' self-employment decisions, namely unemployment rates (at the current date and at the Special Module date), fertility levels (at the current date and at the Special Module date), the nest-leaving index (at the current date only), female labor-force participation (at the current date and at the Special Module date), and social norms (defined as country-specific). These variables are represented by X_c for those that refer to the survey year (2011), and X^{sm}_c for those that refer to the Special Module year (i.e., when respondents were 14 years old). Thus, we estimate Equation (5) as follows:

$$S_{ijc} = \beta_0 + \beta_1 S^f_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \beta_4 X^f_{ijc} + \beta_5 X_c + \beta_6 X^{sm}_c + \varepsilon_{ijc}, \quad (5)$$

which excludes country fixed effects δ_c, since they are collinear to the country characteristics captured by X_c and X^{sm}_c.[8]

In order to estimate the specific intergenerational correlation of self-employment in the analyzed countries, Equations (2) and (3) are also estimated for each of the countries separately.[9] In doing so, we omit country fixed effects, and we include robust standard errors. An alternative approach to study differences in the intergenerational correlation of self-employment across countries consists of estimating equations for the pooled sample but including interaction terms between the main explanatory variables and country dummies. Both cross-country estimates and interaction estimates produce similar conclusions but, since cross-country estimates provide us directly with point estimates on the transmission of self-employment for each analyzed country, we focus on cross-country estimates. Estimates including interaction terms are shown in Table A3 in the Appendix.

4. Results

4.1. Pooled results and heterogeneous effects

Table 2 shows the results of estimating Equation (1) when we pool all the countries together, and all the respondents (i.e., sons and daughters of the analyzed households).[10] Column (1) shows estimates of Equation (1) on sons and daughters in the same sample, Column (2) shows estimates when the sample is restricted to sons, and Column (3) when the sample is restricted to daughters. As the main explanatory variable in Equation (1) is whether a parent was self-employed when children were 14 years old, without differentiating between which parent was self-employed, these estimates represent the overall correlation of self-employment between parents and sons.

Focusing on the main coefficients of interest, estimates point to the existence of a statistically significant intergenerational correlation of self-employment. The probability of an individual being self-employed is 10.8 percentage points higher if that individual had a self-employed parent when the child was 14 years old. This intergenerational correlation is found to be statistically significant at standard levels for both sons and daughters, as shown in Columns (2) and (3). However, the results indicate that there are gender differences in the transmission of self-employment, as the estimated intergenerational correlation is greater for sons than for daughters, with the difference being statistically significant at standard levels ($p < 0.001$). Specifically, the change in the probability of a son being self-employed is about 15.3 percentage points higher if he had a self-employed parent when he was 14 years old. The increase for daughters is estimated to be about 6.0 percentage points.

We next estimate Equations (2) and (3), and then analyze

[6] Since our dependent variable is a dichotomous variable, we have alternatively estimated Equation (1) using both Logit and Probit models. The main estimates are robust to OLS estimates, and for the sake of simplicity in the interpretation of coefficients we rely on OLS for the main results. These alternative results are shown in Table A1 in the Appendix. Logit and Probit estimates of the non-baseline estimates are also robust, and are available upon request.

[7] Variance Inflation Factors (VIF) reveal no multicollinearity issues.

[8] All the estimates are robust to the inclusion of either country controls, or country fixed effects.

[9] Estimates on daughters, and estimates when considering mothers' characteristics, are shown in Table A2 in the Appendix.

[10] Coefficients associated with occupation dummies and country dummies are available upon request.

Table 2
Main estimates of the transmission of self-employment.

Variables	All	Sons	Daughters
	(1)	(2)	(3)
Parent self-employed	0.108***	0.153***	0.060***
	(0.009)	(0.016)	(0.003)
Individual/household variables			
Age	0.012***	0.017***	0.006*
	(0.002)	(0.002)	(0.003)
Age squared	−0.001***	−0.002***	−0.001*
	(0.000)	(0.000)	(0.000)
Never married	0.003	0.007	−0.011*
	(0.008)	(0.011)	(0.005)
Secondary ed.	0.008	0.009	0.004
	(0.008)	(0.009)	(0.010)
University ed.	−0.000	−0.005	0.008
	(0.012)	(0.013)	(0.016)
No. of children	0.001	0.000	0.002
	(0.001)	(0.001)	(0.001)
Household income	−0.000	−0.000*	−0.000
	(0.000)	(0.000)	(0.000)
Constant	−0.260***	−0.377***	−0.119**
	(0.026)	(0.045)	(0.048)
Occupation fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
R-squared	0.092	0.104	0.073
N. Observations	64,294	31,859	32,435

Note: Robust standard errors clustered at the country level in parentheses. The sample (EU-SILC, 2011) is restricted to employed individuals who filled-in the ITD, who are not students, retired, or disabled. The dependent variable is the self-employment status of respondents (1 if self-employed, 0 if employee). Self-employed parent takes value 1 if the father or the mother were self-employed, 0 otherwise. *** Significant at the 99%; ** significant at the 95%; * significant at the 90%.

heterogeneous effects, i.e., whether there are gender differences in the transmission of self-employment, not only differentiating between sons and daughters, but also between fathers and mothers. Some authors have concluded that intergenerational transmissions are gender specific (Colombier and Masclet, 2008; Wang, 2010; Farré and Vella, 2013; Lo et al., 2020), and thus one could expect that the transmission of self-employment would be stronger between fathers and sons (mothers and daughters), rather than between fathers and daughters (mothers and sons). Table 3 shows the main coefficients of Equations (2) and (3). Columns (1) and (2) show estimates of Equations (2) and (3) on the sample of sons, and Columns (3) and (4) show estimates on the sample of daughters.[11] (Additional coefficients are available upon request.)

Focusing on Columns (1) and (2), results indicate that if the father was self-employed in the past, there is an increase of about 15.7 percentage points in the probability of the son being self-employed at the date of the interview; if the mother was self-employed, the probability of the son being self-employed increases by 13.7 percentage points. Despite that this difference suggests that the transmission is stronger between fathers and sons than between mothers and sons, the difference is not statistically significant at standard levels, according to a *t*-test ($p = 0.307$). Then, we cannot conclude that the transmission of self-employment is stronger between fathers and sons than between mothers and sons. Columns (3) and (4) show estimates on daughters, and we find that if the father (mother) was self-employed in the past, there is an increase of about 5.6 (9.2) percentage points in the probability of the daughter being self-employed at the current date. The difference between these two intergenerational elasticities is statistically significant at

[11] The results are robust when we restrict the sample to children with information for both parents, and include both the father's and the mother's self-employment status in the estimates. These estimates are available upon request.

Table 3
Heterogeneous effects: estimates by parents' gender.

Variables	Sons	Sons	Daughters	Daughters
	(1)	(2)	(3)	(4)
Father self-employed	0.157***	–	0.056***	–
	(0.016)		(0.004)	
Mother self-employed	–	0.137***	–	0.092***
		(0.011)		(0.008)
Constant	−0.385***	−0.364***	−0.100	−0.129**
	(0.050)	(0.044)	(0.059)	(0.052)
Individual/household variables	Yes	Yes	Yes	Yes
Occupation fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.107	0.087	0.075	0.073
N. Observations	29,304	31,343	29,439	31,949

Note: Robust standard errors clustered at the country level in parentheses. The sample (EU-SILC, 2011) is restricted to employed individuals who filled-in the ITD, who are not students, retired, or disabled. The dependent variable is the self-employment status of respondents (1 if self-employed, 0 if employee). *** Significant at the 99%; ** significant at the 95%; * significant at the 90%.

standard levels ($p < 0.001$), suggesting that the transmission of self-employment is stronger between mothers and daughters than between fathers and daughters. Additionally, estimates suggest that the transmission between fathers and sons is stronger than the transmission between fathers and daughters ($p < 0.001$), and the transmission between mothers and sons is stronger than the transmission between mothers and daughters ($p = 0.001$).

Tables 2 and 3 support certain conclusions. First, the heterogeneous results indicate the existence of gender differences in the transmission of self-employment, which are important not only when considering the gender of children, but also when considering the gender of parents. Of all the estimated intergenerational correlations, the strongest seems to be the correlation between fathers and sons, followed by the correlation between mothers and sons, then between mothers and daughters, and finally between fathers and daughters. Second, despite these differences, all four intergenerational correlations are still highly significant. Third, this correlation is qualitatively robust to the specification used (see Table A1 in the Appendix). Further research should focus on investigating differences in intergenerational correlations, and disentangling potential channels that could drive those differences, such as different personality traits or levels of business skill (Li and Goetz, 2019).

Table 4 shows whether controlling for certain parental attributes and country characteristics can change the estimated intergenerational correlations, thus driving the estimated results. Given that women's labor-market participation has traditionally suffered from endogeneity (Attanasio et al., 2008; Blundell et al., 2016; Kumar, 2016; Theloudis, 2021), we focus on the correlation between fathers and sons for these additional results. Column (1) shows the baseline estimates, Column (2) includes father controls as described by Equation (4), and Columns (3) and (4) include country controls at the date of the interview (2011), and the date of the Special Module, as described by Equation (5). The coefficient remains quantitatively unchanged in all specifications, regardless of the presence of parents' attributes and country characteristics. Furthermore, estimates including only country characteristics but omitting fathers' attributes are also robust (and are available upon request, as are estimates for the correlations between mothers and sons, fathers and daughters, and mothers and daughters). The results are again similar to the main estimates shown in Table 4.

4.2. Results by country

Table 5 shows the main estimates of Equation (2), for men, when countries are considered individually. That is to say, the Table shows

Table 4
The transmission of self-employment, father attributes, and country characteristics.

Variables	Baseline	Plus father controls	Plus country controls	Plus country SM controls
	(1)	(2)	(3)	(4)
Father self-employed	0.157***	0.158***	0.158***	0.158***
	(0.016)	(0.016)	(0.016)	(0.016)
Father attributes (Special Module)				
Age of father	–	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)
Married father	–	−0.029	−0.030	−0.030
		(0.023)	(0.023)	(0.023)
N. of children	–	−0.005	−0.006	−0.005
		(0.003)	(0.003)	(0.003)
Financial situation	–	0.005	0.004	0.004
		(0.004)	(0.004)	(0.005)
Constant	−0.385***	−0.342***	0.146	0.218
	(0.050)	(0.043)	(0.463)	(0.514)
Country characteristics	No	No	Yes	Yes
Country characteristics (Special Module)	No	No	No	Yes
Individual/ household variables	Yes	Yes	Yes	Yes
Occupation fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	No	No
R-squared	0.107	0.108	0.107	0.107
N. Observations	29,304	29,304	29,304	29,304

Note: Robust standard errors clustered at the country level in parentheses. The sample (EU-SILC, 2011) is restricted to employed sons who filled-in the ITD, who are not students, retired, or disabled. The dependent variable is the self-employment status of sons (1 if self-employed, 0 if employee). Father attributes refer to the characteristics of the household when the respondents were 14 years old. *** Significant at the 99%; ** significant at the 95%; * significant at the 90%.

estimates by country of the intergenerational correlation of self-employment between fathers and sons. (Additional coefficients are available upon request.) Estimates of the correlations between mothers and sons, fathers and daughters, and mothers and daughters are shown in Table A2 in the Appendix. Fig. 2 displays the main coefficients.[12] All the columns include the full vector of individual and household controls shown in Table 2 - occupation fixed effects, fathers' attributes, and country characteristics as of the date of the special module. Country characteristics for the year 2011 are excluded, since they do not change for each country subsample, and thus cannot be included as explanatory variables in this cross-country analysis.

Columns (1) to (9) show the intergenerational elasticities of self-employment in the analyzed countries. This elasticity is strongest in Belgium, where sons of self-employed fathers are self-employed with a probability 19.5 percentage points higher than sons of non-self-employed parents. Belgium is followed by Luxembourg (where the elasticity is estimated to be around 19.0 percentage points), France (14.2 percentage points), Austria (14.1 percentage points), the UK (10.8 percentage points), Greece (10.4 percentage points), Spain (9.6 percentage points), the Netherlands (8.5 percentage points), and Sweden (5.5 percentage points). Furthermore, all nine coefficients are statistically significant at standard levels, and the only country in which the correlation is not significant at the 99% level is Sweden (where it is significant at the 90% level only).

These estimates are in line with prior research quantifying the intergenerational transmission of self-employment.[13] Dunn and Holtz-Eakin (2000) found that self-employment rates in the US were about double for workers with a self-employed parent. Andersson and Hammarstedt (2011) found, on the other hand, that Swedish self-employment rates were about 10% higher if parents were self-employed, while we found an increase of about 5.5% in that same country. Our results also diverge from Lindquist et al. (2015), who found differences of about 60%. Blumberg and Pfann (2016) found differences in the rates of self-employment of about 20% between 1st and 2nd generation self-employed workers, while our estimates suggest similar differences in some countries (Belgium and Luxembourg), and smaller differences (but still significant) in others. Similarly, Ferrando-Latorre et al. (2019) found that children of self-employed parents were about 18% more likely to become self-employed, while the similar coefficient in our study is estimated at about 9.6%. Hopp et al. (2019) found an increase in the probability of being self-employed of about 10% in Germany, conditional on the parents being self-employed, which is similar to the estimates in our analysis for other European countries.

Table 5
Estimates of the transmission of self-employment, by country.

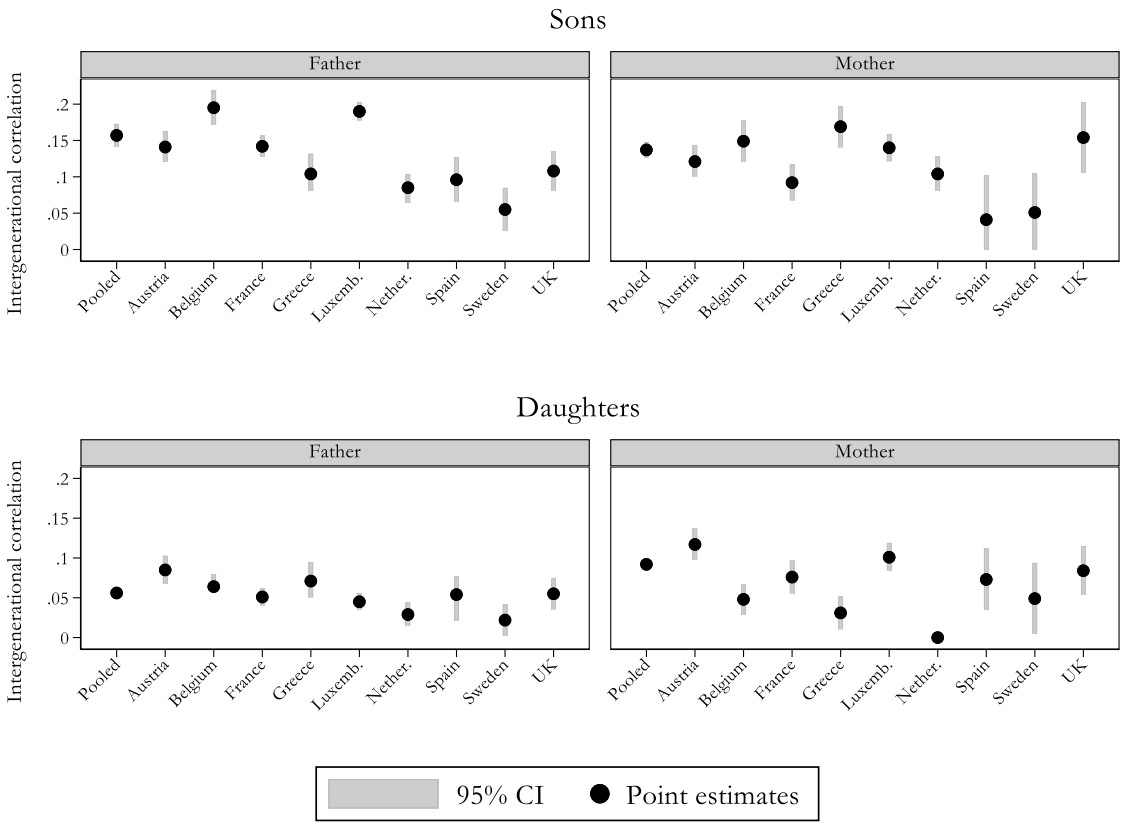
	Belgium	Luxemb.	France	Austria	UK	Greece	Spain	Netherl.	Sweden
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Father self-employed	0.195***	0.190***	0.142***	0.141***	0.108***	0.104***	0.096***	0.085***	0.055*
	(0.024)	(0.013)	(0.015)	(0.022)	(0.027)	(0.028)	(0.031)	(0.019)	(0.030)
Individual/household var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.123	0.121	0.222	0.182	0.092	0.076	0.060	0.262	0.096
No. Observations	2325	8839	6176	2553	2155	1500	2180	2783	793

Note: Robust standard errors in parentheses. The sample (EU-SILC, 2011) is restricted to employed sons who filled-in the ITD, who are not students, retired, or disabled. The dependent variable is the employment status of sons (1 if self-employed, 0 if employee). Countries sorted in descending order in terms of point estimates of the transmission of self-employment between fathers and sons. *** Significant at the 99%; ** significant at the 95%; * significant at the 90%.

Table A3 in the Appendix shows alternative estimates of country differences, based on Equation (2) and including individuals of all the countries of the sample, in addition to country fixed effects and interaction terms between country dummies and the self-employed parents'

[12] Results applying Logit and Probit models are robust. These estimates are available upon request.

[13] Several analyses have relied on Logit or Probit estimates, but they do not provide a quantitative estimate of such intergenerational correlations of self-employment. These estimates are in line with the Logit and Probit coefficients displayed in Table A1 in the Appendix.



Note: The sample (EU-SILC 2011) is restricted to employed individuals who filled-in the ITD, who are not students, retired, or disabled. Estimates represent the main parameters in Tables 3, 5, and A2. Negative intergenerational coefficients are displayed as zeros. Countries sorted alphabetically.

Fig. 2. Summary of intergenerational coefficients.

dummy variables. The UK is set as the reference country for interaction terms. These pooled interaction estimates produce similar conclusions to the cross-country estimates in Table 5.

5. Potential channels of transmission

The results in Table 5 show country differences in the transmission of self-employment from fathers to sons, but it remains unclear which characteristics could be driving such transmission. The existing research has analyzed the potential determinants of self-employment, but the determinants of the transmission of self-employment have received little attention. Some authors contend that business inheritance is a channel for this transmission (Schafer and Talavera, 2009; Wang, 2010; Bhasi et al., 2020), while others argue that genetic factors explain this vertical transmission (Nicolaou et al., 2008; Nicolaou and Shane, 2010). However, these two potential channels do not explain country differences, as both business inheritance and genetic factors should not be country-specific. On the other hand, family background is a significant determinant of self-employment (Arum and Müller, 2009; Lindquist et al., 2015; Gauly, 2017; Li and Goetz, 2019), and according to Li and Goetz (2019), two important channels for the intergenerational transmission of self-employment are business human capital and personality traits. Unfortunately, these potential channels cannot be directly analyzed using the EU-SILC data, as there is no information on the transmission of managerial skills and business human capital, nor on personality traits. Nevertheless, self-employment and business creation are complex phenomena, and transmission from parents to children may be driven by multiple (potentially complementary) factors, which could change across countries, hence partially explaining country differences in the intergenerational transmission of self-employment.

One potential explanation for such country differences could be the legal framework for employment and business, since a legal framework that encourages self-employment and business activity may affect the intergenerational transmission of self-employment from parents to their offspring. To tackle this issue, we use data from the Global Entrepreneurship Monitor (GEM) dataset, the foremost study of entrepreneurship and business activity, which provides information on the country framework conditions relating to business creation and activity. Specifically, we use the GEM data on framework conditions for the selected countries for the year 2011, and we identify the following business conditions within each country: 1) “financing for entrepreneurs”, 2) “governmental support”, 3) “taxes and bureaucracy”, and 4) “Government programs”. These variables are measured as the averaged values from surveys of 36 experts in each country, with values from 1 (“totally disagree”) to 5 (“totally agree”). High values of these variables represent comparatively good business conditions, while low values represent the opposite. All these items are pooled in a single composite index, through a Principal Components Analysis (PCA), indicating the country business conditions, i.e., the legal context for self-employment.

Table A4 in the Appendix shows the average values for the 4 selected items, and the composite index (which is a standardized factor), representing the country legal framework for business.[14] We also show the

[14] Table A5 in the Appendix shows the values of the country business conditions used in the analysis, for each of the countries in the sample. It also shows the value of the composite index, representing the country legal framework for business. Luxembourg and Austria seem to be the countries with the best legal framework for business creation among the countries in the sample, while Greece and Spain are the countries with the worst.

Table 6
Interaction estimates of the transmission of self-employment, business conditions, and culture.

Variables	Business conditions		Entrep. culture		Both controls	
	(1)	(2)	(3)	(4)	(5)	(6)
Father self-employed	0.159***	0.136***	0.167***	0.104***	0.159***	0.111***
	(0.017)	(0.006)	(0.019)	(0.014)	(0.017)	(0.009)
Business conditions	0.027**	0.022**	–	–	0.028**	0.023**
	(0.009)	(0.009)			(0.009)	(0.010)
x father self-employed	–	0.026***	–	–	–	0.022***
		(0.004)				(0.005)
Entrepreneurial culture	–	–	−0.012	−0.007	0.002	0.004
			(0.010)	(0.009)	(0.007)	(0.007)
x father self-employed	–	–	–	0.031**	–	0.014*
				(0.009)		(0.006)
Constant	−0.350***	−0.341***	−0.334***	−0.337***	−0.350***	−0.344***
	(0.041)	(0.038)	(0.036)	(0.036)	(0.041)	(0.038)
Individual/household variables	Yes	Yes	Yes	Yes	Yes	Yes
Occupation fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Father attributes	Yes	Yes	Yes	Yes	Yes	Yes
Country characteristics	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.103	0.105	0.094	0.095	0.103	0.105
N. Observations	29,304	29,304	29,304	29,304	29,304	29,304

Note: Robust standard errors clustered at the country level in parentheses. The sample (EU-SILC, 2011) is restricted to employed sons who filled-in the ITD, who are not students, retired, or disabled. The dependent variable is the self-employment status of sons (1 if self-employed, 0 if employee). *** Significant at the 99%; ** significant at the 95%; * significant at the 90%.

factor loadings and the main statistics, to test the validity of the composite index. Since all the loadings associated with the initial variables are positive, positive values of the factor variable represent favorable conditions, and negative values the opposite. We observe that all the averages of the variables for the sample countries are estimated at around 2.5, below the mid-point of the variables scale, suggesting that overall legal conditions for business are not especially good in the analyzed countries. On the other hand, the average value of the composite indicator measuring the country legal framework is zero, as expected, given that it is the output of a PCA. Furthermore, the statistics reported in Table A4 point to the validity of the PCA: the composite factor explains 72.8% of the total variance of the variables, the associated eigenvalue is greater than unity, and the Cronbach alpha statistic and the Bartlett sphericity tests point to the appropriateness of the PCA.

We additionally use information from the GEM regarding countries' culture and social norms regarding entrepreneurship, as entrepreneurial culture has been linked to increased entrepreneurial decisions (see Bosma et al., 2020; Bullough et al., 2021). Then, self-employment culture may also affect the transmission of self-employment and thus partially explain country differences in such transmission. The GEM defines a single indicator for entrepreneurial culture, and we consider that indicator in the analysis. This variable takes values from 1 ("totally disagree") to 5 ("totally agree"), and is defined in terms of the following: "The extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income". For the sake of comparability with the business conditions factor, the self-employment culture variable included in the empirical analysis is standardized. Values of the variable at the country level are shown in Table A5 in the Appendix.

In order to analyze whether the country business conditions and entrepreneurial culture may affect the intergenerational transmission of self-employment, we estimate the following equation:

$$S_{ijc} = \beta_0 + \beta_1 S^f_{ijc} + \beta_2 X_{ijc} + \beta_3 X_{jc} + \beta_4 X^f_{ijc} + \beta_5 X_c + \beta_6 X^{sm}_c + \beta_7 Ch_c + \beta_8 Ch_c S^f_{ijc} + \varepsilon_{ijc}, \quad (6)$$

where Ch_c is a vector including the two potential channels analyzed (i.e., business conditions and self-employment culture), for each country c, and the interaction term $Ch_c S^f_{ijc}$ illustrates whether the transmission of self-employment from fathers to their offspring is stronger in those countries in which these conditions are more favorable, beyond the overall transmission, which is captured by the coefficient β_1. The remaining variables are defined as in Equation (5). Equation (6) is estimated for sons, to analyze whether the intergenerational correlation of self-employment between fathers and their sons depends on these channels. (Results for mothers and daughters provide similar conclusions and are available upon request.) It is important to note that, as the sample corresponds to the year 2011 only, we cannot estimate Equation (6) by country, as the country characteristics, including the potential channels Ch_c, would be omitted from the equation.

Table 6 shows the main estimates of Equation (6). In Column (1) we only include the business conditions, and no interaction terms, while Column (2) has the interaction term. Columns (3) and (4) are equivalent but considering self-employment culture only, whereas both controls are included in Column (5), and Column (6) shows the results including both controls and both interaction terms. Thus, we can partially determine whether these variables are potential drivers for the transmission of self-employment. Columns (1), (3) and (5) suggest that controlling for the legal conditions for business and/or for the culture of self-employment do not affect the estimates. However, when we include interaction terms, we find that the coefficient associated with these interactions is positive and highly significant, while coefficient β_1 representing the overall intergenerational correlation of self-employment decreases.

For instance, controlling for the two analyzed factors shows that, in general terms, the sons of fathers who were self-employed in the past have a probability of being self-employed that is 11.1 percentage points higher than sons of parents who were not self-employed. In addition to this general transmission, the results indicate that the probability of the son being self-employed if the father was self-employed is 0.022 standard deviations higher if the country has more favorable business conditions, and 0.014 standard deviations higher if the country's culture encourages self-employment.

These results suggest that, in those countries where the business conditions or the culture of self-employment are more favorable, the transmission of self-employment from fathers to their sons is stronger. Focusing on Column (6), which includes both interaction terms, we find

that the legal conditions for business seem to be more important than the culture of self-employment, as the former is statistically significant at the 99% level and quantitatively larger than the latter, which is significant at the 90% level only. Thus, even when both country business conditions and culture seem potential drivers for the transmission of self-employment, the former seems to be more significant than the latter.

6. Conclusions

This paper empirically analyzes the intergenerational correlation of self-employment in nine European countries, using harmonized data from the EU-SILC special module on intergenerational transmission, for the year 2011. Our results point to a positive and statistically significant intergenerational correlation of self-employment, in the countries analyzed. Furthermore, the magnitude of this intergenerational transmission depends on who is considered; that is to say, it differs between fathers and sons, mothers and sons, fathers and daughters, and mothers and daughters. The self-employment status of both parents is correlated with sons' and daughters' self-employment status in a positive and statistically significant way, although the father appears to be more important in determining the self-employment status of sons, while the mother is more important than the father for daughters. Overall, however, the intergenerational transmission of self-employment appears to be more important for sons. We also find quantitative and qualitative differences among countries, even when we use a harmonized database and the same empirical strategy. These differences indicate that the intergenerational correlation of self-employment is stronger in Belgium, Luxembourg, France, and Austria, while they are less relevant (but still statistically significant) in the Netherlands and Sweden.

We additionally find that parents' characteristics, and country observable characteristics, do not have an impact on estimates, which are robust to different specifications. We investigate two potential channels for the differences across countries, and conclude that the legal conditions for business, and the culture of self-employment, may partially explain differences in transmission. Unfortunately, we cannot disentangle other potential channels for transmission, such as personality traits, specific business, human capital, and managerial skills, business inheritance, or entrepreneurial spirit. Studying these potential channels for the transmission of self-employment, and how differences in these channels may explain country differences is left for future research.

Recent efforts have been made by institutions to promote self-employment and entrepreneurship, as a way of overcoming the devastating effects of the recent economic crisis. Results suggest that intergenerational transmission of self-employment may be determined by long-term factors when workers were young, such as parents' employment status. Furthermore, cross-country differences in this relationship are partially explained by cross-country differences in business conditions for self-employment, and in self-employment culture. Thus, countries could boost self-employment rates via educational programs at school that show the importance of self-employment for the economy of the country, while also offering economic and institutional benefits to the young who want to start their own business.

Our analysis has certain limitations. First, our results do not allow us to talk about causal effects, given potential endogeneity. Second, the analysis may suffer from measurement error, as parents of studied individuals could have been self-employed before or after the year of the special module, but not at the specific time of the special module itself, so the estimated correlations may represent lower bounds to the actual correlation.

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Declaration of competing interest

The authors declare no conflict of interests.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.econmod.2021.105741.

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