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IZA DP No. 15059

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ABSTRACT

Living in Rural Areas and Self-Employment*

This paper examines whether workers living in rural areas are more likely to be self-employed, compared with those in urban areas. We provide evidence for 35 European countries, using the European Working Conditions Survey for the year 2015. We also study the time devoted to market work, and monthly earnings, of self-employed workers in rural and urban areas. Results show that workers in rural areas are more likely to be self-employed than workers in urban areas, although engaging in self-employment in rural areas is associated with significantly lower monthly incomes. We also report differences by welfare state regime. Self-employment is considered a key mechanism to compensate for the difficulty of developing in rural areas, and this paper shows that workers in rural areas in Europe are more likely to be self-employed, despite more challenging working conditions.

JEL Classification: E24, L26, O18

Keywords: rural areas, self-employment, europe, earnings, work hour

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1. Introduction

Self-employment is a potential labor alternative to paid employment, has been seen as a driver of technological change and innovation, and has a direct impact on economic growth and development (Porter, 1990; Acs, 1992; Acs et al., 2004; Audretsch and Keilbach, 2004; Van Stel et al., 2005; van Praag and Versloot, 2007; Minniti, 2008; Kelley et al., 2011; González and Montero, 2014; Bjørnskov and Foss, 2016; Block et al., 2017). As a result, self-employment is high on the agenda of many policy makers and institutions, who have tried to promote self-employment in order to mitigate the effects of economic downturns (Fairlie, 2009; Spors, 2009; Gimenez-Nadal and Molina, 2014; Naudé, 2016). In this context, self-employed workers identify and boost key local resources, with the main objective of attracting investment and generating sustained development (Figueroa-Armijos et al., 2012). Given that self-employment fosters the economic growth of regions, it is important to determine what circumstances both enable and constrain self-employment in rural areas, to address crucial aspects of peripheral settings (Stathopoulou, Psaltopolous and Skuras, 2004; Labrianidis, 2006), such as the understanding of whether self-employment rates are determined by entrepreneurial-based comparative advantages, or whether they reflect rural workers resorting to self-employment as a consequence of labor constraints, or restricted availability of local demand.

Rural self-employment is defined as all forms of self-employment that take place in rural areas, which are characterized by large open spaces and small population settlements, relative to the national context (Kalantaridis and Bika, 2006). Rural self-employment implies an intimate relationship between self-employment activity, and the place where it occurs, and relies on innate natural, cultural, historical, human, social, and financial local resources (Gaddefors and Cronsell, 2009). In general, rural areas experience the negative aspects of regional development of modern societies, due to issues such as migration, ageing, depopulation, low labor productivity, low levels of formal education and human capital, and poor access to public services and infrastructures (Korsgaard, Ferguson and Gaddefors, 2015). Rural landscapes also face significant challenges, as unequal regional development is common in developed countries, and demographic decline in many rural regions has proven to be a growing challenge (Florida, 2003; Naudé, 2008; Collantes et al., 2014).

Despite the importance of self-employment in general terms, and for rural areas in particular, only a few papers have studied self-employment while focusing on the specific setting of the activity, which is a significant challenge for rural self-employed workers

(Hindle, 2010; Welter, 2011). Self-employment is a key factor that can help rural areas to overcome the challenges related to institutional weakness, or the liabilities of residing in peripheral areas (Kitchen and Marsden, 2009), and promote rural development (Labrianidis, 2006; North and Smallbone, 2006). Hence, policy makers have at their disposal a tool to promote and stimulate innovation and economic growth in rural areas, especially considering the increasing importance of self-employment as a central component of rural development (Saxena, 2012).

To the best of our knowledge, research on the spatial location of self-employment is limited (Hindle, 2010; Trettin and Welter, 2011; Welter, 2011; Müller, 2013; Lang, Fink and Kibler, 2014; Korsgaard, Müller and Tanvig, 2015). Rural areas in developed economies tend to have certain common characteristics, namely depopulation, weak communication infrastructure, small markets resulting in limited economies of scale, lack of human, cultural and financial capital resources, and knowledge spillovers (Henderson et al., 2007; Goetz et al., 2010; Korsgaard et al., 2015). The spatial context also affects self-employment (Bosma et al., 2008), as it has been found to be stimulated close to urban cores (Mueller, van Stel and Storey, 2008), Universities (Audretsch and Fritsch, 2002; Audretsch and Feldman, 2004), and other small and medium-sized businesses (Audretsch and Keilbach, 2004; Beugelsdijk and Noorderhaven, 2004). Furthermore, rural areas, are characterized by "institutional thinness" (Tödtling, Lengauer and Höglinger, 2011), meaning that they are lacking in production organizations, which produces decreased economic and development outcomes (OECD, 2006).[1]

Within this framework, this paper explores self-employment in rural, intermediate, and urban areas of European countries, using data from the European Working Condition Survey (EWCS) for the year 2015. Specifically, we analyze whether workers living in rural areas are more likely to be self-employed, compared with those living in urban or urban-intermediate areas, net of individual observable characteristics. We also analyze self-employment outcomes in rural, intermediate, and urban areas, focusing on differences by urban status, and also on differences between employees and self-employed workers. The results suggest that workers in rural areas are more likely to engage in self-employment than similar workers in urban areas. Furthermore, self-employed workers tend to work longer hours than employees, but they do not receive higher monthly earnings. Results also show that rural

[1] Some authors argue that self-employment in rural areas tends to be concentrated in agricultural occupations. Nevertheless, McElwee (2006, 2008) and Vik and McElwee (2011) conclude that the relationship between agriculture and self-employment is complex in those areas.

self-employed workers earn lower incomes, although their counterparts in urban areas do not work more hours. These findings are robust to a number of specification checks. Finally, we report differences in the analyzed conditional correlations across countries, depending on welfare state regimes.

This paper contributes by studying the role of the urban or rural context in self-employment and self-employment outcomes. To the best of the authors' knowledge, this is the first empirical analysis of the urban factors related to self-employment in Europe in a cross-country setting, using harmonized and homogenized data. The contributions are then threefold. First, we study the conditional correlation between self-employment, and the rural/urban context in a multi-country scenario, reporting differences in that correlation across country groups. Second, we analyze self-employed workers' net monthly earnings, focusing on differences between rural and urban areas, differences between self-employed workers and employees, and heterogeneous effects between urbanization levels and self-employment status. Finally, we study the differences in the time spent working by self-employed and employee individuals in rural and urban areas, and also consider heterogeneous effects by interacting urban levels and self-employment status. The findings from this multi-country analysis contribute to our understanding of rural self-employment by accounting for the effects of different institutional and cultural environments in Europe. Thus, we seek to contribute to the understanding of the role of the rural/urban context in self-employment. This is a crucial aspect of self-employment in order to understand the variations of self-employment, as well as the different results obtained at national, regional, and local levels by prior research.

The remainder of this paper is organized as follows. Section 2 reviews the existing research on self-employment in rural areas. Section 3 describes the data and variables, and Section 4 shows the econometric strategy. Results are shown in Section 5, and Section 6 concludes.

2. Literature review

Self-employment has attracted research interest in recent decades (see van Praag and Versloot, 2007; Fuentelsaz et al., 2015; Bosma et al., 2020, for literature reviews), and several authors have compared self-employed workers and employee decisions (Hamilton, 2000; Carrasco, Martínez-Granado and Albarrán, 2009; Molina, Velilla and Ortega, 2016). Existing research has focused on analyzing self-employment from an aggregated, or macroeconomic

perspective, using aggregated data on self-employment levels, and how such levels are related to or affected by institutions (Acs, 1992; Berrios-Lugo and Espina, 2014), government support (Bjørnskov y Foss, 2016), specific policies (Henderson 2002; Spencer and Gómez, 2003; Escalante and Turvey, 2006), taxes (Spencer and Gómez, 2003), and the macroeconomic context (Amorós et al., 2012; Berrios-Lugo and Espina, 2014). Despite that these studies, based on aggregate variables, allow researchers to analyze self-employment rates, their fluctuations, and their aggregate determinants, they are limited, since they do not provide information on the characteristics and behaviors of the individuals who become self-employed, such as family and personal attributes, income levels, human capital and skills, and financial situation (Coduras et al., 2018). Thus, some authors have studied self-employment in an individual (or microeconomic) setting in recent years (Fairlie, 2009: Spors, 2009; Gimenez-Nadal and Molina, 2014; Molina, Velilla and Ortega, 2016).

Among the different topics related to self-employment studied in recent years, some authors have focused on comparing the earnings of self-employed workers, and the salaries of employees. Carrasco, Martínez-Granado and Albarrán (2009) study the earnings differentials between employees and self-employed workers in Spain, showing that the former have a significantly higher level of labor earnings than the latter. A similar result is found by Molina, Velilla and Ortega (2016) for Spanish employees and self-employed workers. Hamilton (2000) studied differences in earnings between private sector wage-earners and the self-employed and found that the growth rate for wage-earners was higher than that of the self-employed.

Another topic that has attracted research attention is that of self-employed workers human capital and skills (Mengistae, 2006; Brixiova et al., 2015). Although some authors have found that higher levels of formal education and human capital correlate with a higher probability of being self-employed (Keeble, Bryson and Wood, 1993; Ertuna and Gurel, 2011), others have concluded that highly educated individuals prefer to work as employees, rather than self-employed workers, given that these individuals prefer not to confront the risks and instability of setting-up a business (Galindo, Méndez and Navarro, 2010). In addition to formal education, there is consensus about the positive impact of managerial skills on self-employment. Prior literature has found that formation, entrepreneurial, and managerial skills are an important determinant of self-employment decisions and success (Kotsova, 1997; Ramachandran and Shah, 1999; Mengistae, 2006; Minniti, 2009; Levie and Autio, 2013; Rostam-Afschar, 2014; Brixiova et al., 2015; Kyrö, 2015).

Self-employment is also considered an option to improve the work-life balance of women (DeMartino and Barbato, 2003; Lombard, 2007; Gimenez-Nadal et al., 2012) and thus self-employment could make it possible to combine paid work with the care of children. At this point, Campaña, Gimenez-Nadal and Molina (2020) find, in four Latin American countries, that self-employed mothers devote less time to paid work, and more time to unpaid work and childcare, especially educational childcare, compared to employed mothers.

The literature has also attempted to address how self-employment correlates with and is affected by economic growth, especially during the recent economic crisis of the 2000s, though findings do not yet provide robust results. Some studies conclude that the main objective of the self-employed in recessions is to take advantage of opportunities, while others suggest that it is unemployment that drives them to seek self-employment. For example, the Kauffman Index of Entrepreneurial Activity published in 2009 showed that the recession caused by the financial crisis led to an increase in self-employment due to necessity (Fairlie, 2009; Spors, 2009). Similarly, Gimenez-Nadal and Molina (2014) found that unemployment is expected to have a strong impact on self-employment. However, the relationship between self-employment and unemployment may depend on regional aspects, on the entrepreneurial spirit, or on socio-demographic characteristics (Congregado et al., 2010; Cueto et al., 2015). For instance, if self-employment is seen as strong and attractive in a given region, people may consider it an alternative to salaried employment as a way to escape unemployment. Conversely, if it is not well-regarded in a different region, increases in unemployment may not be followed by increases in self-employment (Thurik, Carree, Van Stel and Audretsch, 2008).

Regarding the relationship between entrepreneurship and residential area, Akgün et al. (2011) provide a literature review, concluding that self-employed workers in rural areas are relatively older compared to those in urban areas, better educated, and develop non-agricultural businesses. Moreover, immigrants who became entrepreneurs in these rural areas tended to be older, looking for a particular way of life that was uniquely offered by these rural communities, ignoring the so-called "economic rationality". Rural economies are often characterized by depopulation processes, inadequate investment in services and infrastructure, and limited levels of human capital. This is why much of the literature on rural development aims primarily to address these weaknesses (Wortman, 1990; Keeble and Vaessen, 1994; Pallares-Barbera et al., 2004; Meccheri and Pelloni, 2006; McElwee and Annibal, 2010; Kalantaridis and Bika, 2011). The evidence suggests that new businesses stimulate growth in rural areas (Robinson, Dassie and Christy, 2004; Olfert and Partridge,

2010; Korsgaard et al., 2015), and so policy makers have considered self-employment as a channel for development (e.g., the 11th edition of the OECD Rural Development Conference in 2019 highlighted the importance of exploiting regional assets as a means of boosting economic development). However, the potential of self-employment to stimulate growth in rural areas remains an understudied topic and thus unclear and inconclusive (Stockdale, 2006; McGranahan et al., 2011).

Other studies also highlight the particular benefits that these areas can have for self-employed workers, such as greater stability and greater employee loyalty (Pallares-Barbera et al., 2004), as well as lower costs (Keeble and Tyler, 1995), greater availability and lower costs of land (Pallares-Barbera et al., 2004), competitive advantages due to better living conditions (Keeble and Tyler, 1995; Meccheri and Pelloni, 2006), and the availability of emerging or niche markets (Keeble and Tyler, 1995; Meccheri and Pelloni, 2006). Rural areas can also offer certain kinds of lifestyle that are attractive to self-employed workers. Furthermore, the recent improvements in information and telecommunication technologies have enabled self-employed workers to settle in rural areas while managing their businesses with fewer limitations.

Migration has also been linked to self-employment and economic development in rural areas, as it produces new resources and ideas, different ways of thinking, and broader connections outside the community (Bosworth, 2010; Akgün et al., 2011; Bosworth and Atterton, 2012). Despite that, several rural areas face depopulation processes, i.e., the out-migration of their younger population. Against this detrimental effect of migration of young workers, the promotion of self-employment in these rural areas could offer an alternative to depopulation and, at the same time, boost rural development (Saxena, 2012). In this context, older individuals in these areas have been found to provide financial resources and accumulated experience that could position them as successful entrepreneurs (Shields et al., 2001). Indeed, the results obtained by Deller et al. (2019) suggest that the migration patterns of senior workers may play a more important role in understanding rural self-employment than the migration of young workers.

3. Data and variables

We use data from the European Working Conditions Survey (EWCS), for the year 2015. The EWCS is a micro cross-sectional database conducted every five years by Eurofund, since

1990.[2] The EWCS is based on stylized questionnaires and includes information for the 28 members of the European Union, together with the five candidate countries (Albania, Macedonia, Montenegro, Serbia, and Turkey), Switzerland, and Norway. The main objective of the EWCS is to provide researchers and institutions with harmonized, cross-national information on the conditions of workers in their respective workplaces. In addition, it includes socio-demographic, economic, and employment information for surveyed individuals. Unfortunately, the information provided by the EWCS data has evolved during the recent waves, and some key variables are not present in questionnaires in previous waves of the survey. Thus, we use cross-sectional data for the year 2015.

Since we are interested in workers, our sample is restricted to employed and self-employed respondents and we omit from the sample all respondents who are students, unemployed workers, inactive individuals, retired individuals, and other non-working individuals. The analysis encompasses workers aged between 16 and 65 years old (Aguiar and Hurst, 2007; Gimenez-Nadal and Sevilla, 2012), who report being employed or self-employed.[3] Workers with missing information on important variables, such as demographics, occupation, employment outcomes, household composition, and urban status are omitted from the sample. These restrictions leave a sample of 38,203 respondents, of which 19,197 are men and 19,006 are women. Sample composition, by country, is shown in Table 1.

The survey contains information on the self-reported employment status of individuals, by asking respondents the following question: "Do you work as an employee or are you self-employed?"; self-employed workers include "persons who have their own business or are partners in a company", "respondents who work as employees for their own business" and "members of producers' cooperatives". Thus, the EWCS allows for a clear identification of self-employed workers. Based on this information, we follow Gimenez-Nadal, Molina and Velilla (2020, 2022), and define a dummy variable that takes value 1 if the respondent is self-employed, and 0 otherwise (employees). In our sample 5,942 respondents are self-employed; a rate of self-employed workers of 15.55%, while the remaining 32,261 respondents are employees.

The main explanatory variable of the analysis is that characterizing whether respondents reside in urban or rural areas. Area of residence may influence workers' decisions; as with

[2] https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys-ewcs.

[3] Since the retirement age may differ between countries, we selected the age limit of 65 years to be consistent with studies.

geographical differences, living in rural areas implies limited access to education and other services, such as health care (Canelas and Salazar, 2014). This information was first included in the 2015 wave of the EWCS data, in which respondents reside in "urban areas", "intermediate urban areas", or "rural areas". The urbanization information is based on the DEGURBA classification, that defines three degrees of urbanization in terms of "Local Administrative Units" (NUTS 2 in the case of EWCS), as: 1) urban areas (cities, densely populated areas), 2) urban intermediate (towns and suburbs, intermediate density areas), and 3) rural areas (thinly populated areas).[4] We then define three dummy variables, for each of these categories.

Two other key variables in the empirical analysis are workers' labor supply (i.e., market work hours), and workers' earnings. Respondents labor supply is defined in the EWCS as the number of hours usually worked per week in the main job, according to the following question: "how many hours a week on average do you work in your main paid job?". For respondents' labor income (i.e., earnings), the EWCS includes information on net monthly earnings, defined as net monthly income from the main job of the respondent (after tax and social security contributions), and defined in Euros. This information is gathered from the following survey question: "how much are your net monthly earnings from your main paid job?".

We also consider several socio-demographic characteristics of respondents that may be related to self-employment. We define respondents' gender as a dummy that takes a value of 1 for males, 0 for females, age, measured in years, and age squared, to partially control for non-linear relationships, and to account for the distribution of time over the life-cycle (Kalenkoski et al., 2005; Aguiar and Hurst, 2007). The maximum level of formal education achieved by respondents is defined in the EWCS as a qualitative variable taking the following values: 0) "pre-primary education", 1) "primary education or first stage of basic education", 2) "lower secondary or second stage of basic education", 3) "(upper) secondary education", 4) "post-secondary non-university education", 5) "first stage of university education", and 6) "second stage of university education". For the sake of simplicity, we recode education and define three dummy variables, as follows: primary education (value 1 for individuals whose education category is 0 or 1, 0 otherwise), secondary education (value 1 for individuals whose education category is 2, 3, or 4, 0 otherwise) and university (value 1 for individuals whose education category is 5 or 6, 0 otherwise). We also consider household characteristics, such

[4] See https://ec.europa.eu/eurostat/ramon/miscellaneous/index.cfm?TargetUrl=DSP_DEGURBA.

as the presence of a partner in the household (a dummy variable taking the value 1 for individuals living with a partner, 0 otherwise), the number of individuals in the family unit (including the respondent), and the number of children. Finally, we define some variables related to respondents' employment, including whether the respondent is a full-time worker (value 1, 0 for part-time workers), and a public sector employee (value 1, 0 for private sector employees), and whether the respondent supervises other workers in their job. More details for the definition of variables are shown in Table A1 in the Appendix.

3.1 Descriptive statistics

Tables 2 and 3 show summary statistics of our variables, differentiating between self-employed workers and employees in Table 2, and between workers in urban and rural areas in Table 3. We also show *t*-type test *p*-values for the respective differences. According to Table 2, the average age of the self-employed in the sample is 45.2 years, vs the 41.9 years of the average employee, with this difference being statistically significant at standard levels. Regarding respondents' gender, 62.2% of the self-employed are male, vs 48% of the employees. Focusing on education, 25.9% (15.5%) of the self-employed (employees) have primary education, while 45.2% (49.4%) have secondary education, and 28.9% (35.1%) have attended University. Thus, summary statistics show an average higher level of education among employees, compared to the self-employed.

Regarding household composition, 72.4% of the self-employed, and 64.9% of employees cohabit with a married or unmarried partner, and the average family size is 3.1 members for the self-employed, and 2.9 members for employees. The number of children in the household exhibits similar descriptives, as the average number of children under 5 years is 0.1 for both the self-employed and employees, whereas the average number of children between 5 and 17 years is 0.51 for the self-employed, and 0.46 for employees, with the difference being statistically significant. Self-employment has been found to be a labor career more compatible with flexible work arrangements, so these descriptives are in line with Gimenez-Nadal, Molina and Ortega (2012).

Focusing on the employment attributes of respondents, Table 2 shows that the self-employed spend, on average, 43.5 hours per week on market work, while the average employee spends 38.3 hours per week. This is a statistically significant difference of about 5.3 hours per week; in other words, the self-employed work about 12% more hours than employees. Regarding the type of worker, 81.0% of the self-employed are full-time workers,

vs 81.7% of employees, with the difference being not significant at standard levels, whereas 1.8% of the self-employed work in the public sector, vs 28.5% of employees. The average self-employed worker reports net earnings of about €1,408 per month, vs the €1,368 reported by the average employee.

Finally, when comparing the urbanization status of the areas of residence, Table 2 shows that 37.6% of the self-employed reside in urban areas, vs 43.1% of employees. 25.0% of the self-employed live in urban-intermediate areas, and the remaining 37.4% live in rural areas. Conversely, 30.1% of employees reside in intermediate areas, vs 26.8% who live in rural areas. This suggests that comparatively more employees than self-employed workers are located in urban and urban-intermediate areas, but more self-employed workers are located in rural areas. All these differences between employees and self-employed workers are statistically significant at standard levels.

Table 3 shows the summary statistics of variables, for workers in rural areas and in urban areas. The average age of workers in rural areas is 43.4 years, vs 42.1 years of the average worker in urban/intermediate areas, with the difference being statistically significant. There also are relatively more males in rural areas (51.1% of the sample) than in urban/intermediate areas (49.9%), with the difference being significant at the 95% level. More respondents in urban/intermediate areas have attended University (37.4%), than the similar percentage in rural areas (25.9%), though relatively more individuals in rural areas have secondary education, than in urban/intermediate areas (53.5% vs 46.8%). Regarding household characteristics, comparatively more individuals live in couple in rural areas than in urban/intermediate areas (70.4% vs 64.3%), and family size and the number of children are larger in rural areas than in urban/intermediate areas. All these differences are statistically significant.

As for the employment characteristics of workers in rural and urban/intermediate areas, 20.4% of the respondents in rural areas are self-employed workers, whereas only 13.6% of respondents in urban/intermediate areas are self-employed, with the percentage difference being highly significant. Workers in rural areas also spend more time working (39.3 hours per week on average), compared to workers in urban/intermediate areas (38.9 hours), even though there is a higher rate of full-time employment in urban/intermediate areas than in rural areas (81.9%, and 80.7%, respectively). The rate of public workers, however, is not dependent on the urbanization level, with about 24% of respondents being public sector workers in rural and urban/intermediate areas. The average worker in a rural area earns about

€1,256 per month, vs €1,419 per month earned by the average worker in urban/intermediate areas.

These descriptive statistics show statistically significant differences between employees and self-employed workers, and between workers in rural areas and workers in urban/intermediate areas. Furthermore, statistics reveal that comparatively more self-employed workers reside in rural areas, compared to the numbers of self-employed workers who reside in urban/intermediate areas. We also report statistically significant differences in employment outcomes of employees and self-employed workers, since the self-employed work longer hours per week and earn slightly more than employees. Differences in these attributes also arise between workers in rural and urban/intermediate areas, as the average worker in a rural area works longer hours, but their income is significantly lower, than the average worker in urban/intermediate areas. In the following sections, we focus on these differences.

4. Econometric strategy

We first estimate the conditional correlations between self-employment, and the rural/urban status of the area of residence, net of worker observed heterogeneity. In doing so, for respondent *i* in country *c*, we estimate the following equation, using OLS:

$$S_{ic} = \alpha + \alpha_U U_{ic} + \alpha_X X_{ic} + \delta_c + \varepsilon_{ic}, \quad (1)$$

where S_{ic} is the dummy variable that takes value 1 if individual *i* in country *c* is a self-employed worker (0 if they are employees), U_{ic} represents the vector of urbanization level variables, including the dummy that characterizes individuals in urban areas, and in urban-intermediate areas (rural areas are considered the reference category), X_{ic} is a vector of respondent demographic characteristics, and δ_c represents country fixed effects to partially capture country differences. Estimates of Equation (1) include specific sample weights provided by the EWCS data, and robust standard errors.

The vector X_{ic} includes gender, age, age squared, education level, marital status, the number of household members, and the number of children. We also control for the job characteristics of respondents, so we consider the type of occupation (i.e., whether workers are in the public sector), and the full- or part-time status of workers. Furthermore, regarding the number of children in the household, we follow Kalenkoski et al. (2005), and differentiate between the number of children under age 5, and the number of kids between 5 and 17 years.

Equation (1) allows us to analyze potential differences in the probability of being a self-employed worker (relative to being an employee) in rural, urban-intermediate, and urban areas, through the vector α_U of coefficients. Furthermore, these estimated differences are net of observable worker characteristics, and net of country differences (partially captured by country fixed effects), thus complementing descriptive results shown in Tables (2) and (3).

Next, we focus on differences in monthly earnings and work hours between self-employed workers and employees, and in urbanization level (Desmet and Fatchamps, 2005; Ottaviano and Pinelli, 2006; Olfert and Partridge, 2010), net of observed characteristics. We additionally analyze differences in earnings and work hours among self-employed workers, depending on the urbanization level of their area of residence. To do so, we estimate the following equations, for each individual *i* in country *c*:

$$Y_{ic} = \beta_0 + \beta_s S_{ic} + \beta_U U_{ic} + \beta_I S_{ic} U_{ic} + \beta_X X_{ic} + \delta_c + \varepsilon_{ic}, \quad (2)$$

$$h_{ic} = \gamma_0 + \gamma_s S_{ic} + \gamma_U U_{ic} + \gamma_I S_{ic} U_{ic} + \gamma_X X_{ic} + \gamma_Y Y_{ic} + \delta_c + \varepsilon_{ic}, \quad (3)$$

where Y_{ic} represents monthly net earnings, h_{ic} represents work hours, and the remaining set of variables are equivalent to those defined in Equation (1).

Equations (2) and (3) are estimated by OLS, and include sample weights provided by the EWCS data. It is important to note that, as is standard when studying labor supply equations, Equation (3) includes respondents' earnings, to partially account for income and substitution effects. In these equations, coefficients β_s and γ_s represent differences in earnings and work hours between self-employed workers and employees, net of observable factors, whereas coefficients β_U and γ_U capture differences in earnings and work hours across urbanization levels. To further account for differences in earnings and work hours among the self-employed, depending on the urbanization level, we include the interaction terms associated with coefficients β_I and γ_I, capturing the additional impact of urbanization among the self-employed (or, equivalently, the additional impact of self-employment, for urbanization groups), once controlling for the correlation between self-employment and earnings and hours, on the one hand, and between the correlation between urban forms and earnings and hours, on the other hand.

5. Results

5.1 Pooled results

Table 4 shows the main estimates of Equations (1), (2) and (3), in Columns (1), (2) and (3), respectively.[5] Results for the self-employment model in Column (1) indicate that the probability of being a self-employed worker is about 6.7 percentage points lower in urban areas than in rural areas; and 6.6 percentage points lower in intermediate areas than in rural areas. Both differences are statistically significant, whereas differences between urban areas and urban intermediate areas are not significant at standard levels ($p = 0.929$). These results suggest that workers in rural areas are not constrained in self-employment decisions, compared to workers in urban and intermediate areas.

Regarding the rest of the variables, results show that being male is positively correlated with the probability of being self-employed (Minniti and Nardone, 2007; Fairlie and Robb, 2009; Ahl and Nelson, 2010; Artz, 2016). Education is correlated with self-employment, as workers with secondary education are less likely to be self-employed, compared to those with basic education level only. However, there seems not to be a significant difference in the probability of being self-employed between workers with basic education and University education, which could be due to different self-employment intentions (e.g., necessity and opportunity). Marital status and the family size are not correlated with self-employment in a significant way, whereas the number of children is positively correlated with the probability of being self-employed (Blanchflower, 2000; Gimenez-Nadal, Molina and Ortega, 2012). Finally, the public sector worker status is negatively correlated with self-employment.

We next estimate Equation (2), and Table 4 shows that workers in urban areas earn, on average, 61.0 more Euros per month, while workers in intermediate areas earn 37.1 more Euros per month, relative to the similar worker in a rural area. Both coefficients are estimated to be statistically significant at standard levels. Furthermore, the average self-employed worker earns 51.2 more Euros per month than the similar employee worker, though the difference is not significant at standard levels. Focusing now on the interaction terms that

[5] We have performed a variety of robustness checks to test how the results change when we modify the estimation technique, or the sample, or include additional variables, shown in Table A2 in the Appendix. For the self-employment model, we have estimated Probit and Logit models, rather than linear probability models. Estimates are robust but, as interpretation of the coefficients is simpler in the linear probability model, we have relied on that model for the main results for the sake of simplicity. For the earnings and work hours models, we have first omitted from the sample public sector workers, and then we have retained full-time workers only. Finally, we have included additional controls, namely whether respondents work as managers supervising 1-9 workers, or supervising 10+ workers. All these estimates are robust to the main results in Table 4.

capture earnings differences between self-employed workers in urban, intermediate, and rural areas, Column (2) shows that self-employed workers in urban (intermediate) areas earn about 226.1 (250.6) more Euros per month than the similar self-employed worker in a rural area, beyond the general difference by urban status. This indicates that earnings differences by urbanization level are far larger among the self-employed than among the general population (i.e., than among employees). Overall, the average self-employed worker residing in an urban area earns about 287.1 more Euros per month than a similar self-employed worker residing in a rural area, whereas the same average difference is about 287.8 Euros between self-employed workers in intermediate and rural areas.

The remaining set of regressors indicate that male workers earn on average 335.8 more Euros per month than the similar female worker, and age is correlated with earnings, forming an "inverted-U" shape. Education is positively related to monthly net earnings, and workers living in couple also report higher earnings than the similar worker not living in couple. Regarding household composition, the number of family unit members is negatively correlated with earnings, while the coefficients associated with the number of kids are positive and significant. Finally, full-time workers earn about 597.7 more Euros per month than part-time workers, net of observable worker characteristics, and the coefficient associated with public sector workers is not statistically significant at standard levels.

Finally, Column (3) in Table 4 shows results for the labor supply estimates of Equation (3). The results suggest that, when we control for worker observable characteristics, differences in weekly work hours between workers in rural, intermediate, and urban areas are not statistically significant at standard levels. The only significant coefficient is that associated with workers in urban areas, indicating that such workers spend about 0.42 less hours per week working than do similar workers in non-urban areas, but it is significant only at the 90% level. Self-employed workers, on the other hand, work on average about 3.2 more hours per week than their employee counterparts. However, we do not find specific differences in work hours for self-employed workers depending upon the urbanization level of the area of residence, since the coefficients associated with the interaction terms are not statistically significant at standard levels. Therefore, results suggest that there are no profound differences in market work time between workers residing in rural areas, and workers residing in urban/intermediate areas, regardless of their employee or self-employed status.

The remaining explanatory variables show that the average male worker spends about 1.9 more hours per week working than the similar female worker, and age shows an "inverted-U" shaped correlation with work hours. Education is estimated to be negatively

correlated with work hours, as workers who have attended University spend about 1.1 less hours per week in market work than the similar worker who has not attended University. Household composition controls are not statistically significant at standard levels, while full-time workers spend about 14.2 more hours per week working than do similar part-time workers, and public sector workers work about 2.2 less hours per week than private sector workers. Finally, monthly earnings show a small but positive and highly significant correlation with market work hours, indicating that each extra 1,000 Euros earned per month are associated with about 2 more hours worked per week.

5.2 Results by welfare state regime

Table 4 shows the overall conditional correlations existing between self-employment status and urbanization level, the interactions between these two characteristics, and self-employment outcomes, for the European countries analyzed. Nevertheless, and even when these estimates partially control for country specific characteristics, potential differences across country clubs cannot be captured by pooled estimates. To take but one example, the correlation between self-employment and earnings may be positive in a country, but negative in several other countries, and thus pooled estimates may not be capturing that divergence. To partially address that limitation, we now estimate Equations (1), (2), and (3), but differentiating among country groups in terms of welfare state regimes.[6] The classification of European countries into welfare state regimes is based on the classification by Esping-Andersen and Fenger (Fenger, 2007).[7] Conservative welfare regime includes Austria, Belgium, France, Germany, Luxembourg and the Netherlands. Ireland, Switzerland and United Kingdom are liberal/Anglo-Saxon countries, whereas Portugal, Italy, Greece, and Spain are classified as Mediterranean. Social-democratic countries include Denmark, Finland, Norway and Sweden. The group of Former USSR countries is formed by Estonia, Latvia, and Lithuania. Bulgaria, Croatia, Czech Republic, Hungary, Poland, and Slovakia are classified as Post-Communist countries. Finally, Albania, Cyprus, Malta, Romania, Slovenia, FYROM, Turkey, Montenegro, and Serbia are defined as other, unclassified countries.

Estimates are shown in Table 5. Panel A shows estimates of the self-employment model, i.e., of Equation (1), while the earnings and work hours models (Equations (2) and (3), respectively) are shown in Panels B and C. Compared to the general results shown in Table

[6] We also report by country estimates in Table A3 in the Appendix. However, given the limited sample sizes for some countries, these by-country estimates should be taken with caution.

[7] http://www.learneurope.eu/files/6713/7526/7222/Welfare_State_models_in_Europe_en.jpg

4, estimates show some qualitative differences in terms of how the probability of being self-employed correlates with the urbanization level of the area of residence, depending on the group of countries analyzed. Results show that in Conservative countries, workers in rural and urban areas tend to be self-employed with the same probability, though the probability of being self-employed in an intermediate area is comparatively lower. In Social-democratic countries, results show no significant differences in the probability of being self-employed, depending on the urbanization status. On the other hand, results for Former USSR countries indicate a lower probability of being self-employed in urban areas than in rural areas, but the difference between intermediate and rural areas becomes not statistically significant. Among Liberal, Mediterranean, Post-Communist, and unclassified countries, the results are robust to the general case, and workers in urban and intermediate areas are self-employed with a relatively lower probability than workers in rural areas.

Regarding the earnings model, estimates by country groups show a high degree of heterogeneity, compared to the pooled estimates in Table 4. In Conservative countries, workers in urban areas earn about 77.8 more Euros per month than workers in rural or intermediate areas, and the difference in earnings between employees and self-employed workers is not significant. Despite that, self-employed workers in urban (intermediate) areas of Conservative countries earn about 281.3 (436.0) more Euros per month than the similar self-employed worker residing in a rural area. In Liberal economies, results show no statistically significant differences in earnings between employees and self-employed workers, and among urbanization levels. This suggests that worker earnings in these economies depend neither on the self-employment status, nor on the urbanization level of the area of residence. Results for Mediterranean economies are similar, but in these countries self-employed workers in urban areas earn about 211.6 more Euros per month than the similar self-employed worker in a non-urban area, with the corresponding coefficient being statistically significant. The remaining coefficients are not significant at standard levels. In Social-democratic countries, the only significant coefficient is that associated with urban areas, suggesting that workers (both employees and self-employed) earn about 72.4 more Euros per month in urban areas, than do their counterparts in rural and intermediate areas.

Focusing now on the earnings model for Post-Communist countries, results show that workers in urban areas earn about 67.8 more Euros per month than workers in rural areas, while workers in intermediate areas earn about 40.3 fewer Euros per month than their counterparts in rural areas. Furthermore, self-employed workers earn about 236.0 more Euros per month than employees, net of observable factors, and there are specific differences

in self-employed worker earnings in terms of the urban level. For instance, self-employed workers in urban areas of Post-communist countries earn about 355.8 more Euros per month than similar self-employed workers in rural and intermediate areas. For workers in former USSR countries, estimates reveal no differences in terms of urbanization levels, though self-employed workers earn, on average, about 344.7 more Euros per month than employees, net of worker observables. Finally, in the remaining (unclassified) countries, estimates show that workers in urban (intermediate) areas make 155.1 (67.3) more Euros per month than their counterparts in rural areas, and that among the self-employed, those in urban areas earn about 259.4 more Euros per month than similar self-employed workers in rural or intermediate areas.

Estimates of the labor supply model indicate that self-employed workers spend more time in market work activities than do similar employee workers in all the country groups studied, but among Liberal and unclassified countries the coefficient is not statistically significant at standard levels. Despite that, results also suggest that some differences in labor supply behaviors and their correlation with urbanization forms and self-employment do exist. For instance, estimates indicate that workers in urban areas spend less time in market work than workers in rural and intermediate areas in Conservative countries, regardless of the self-employment status of workers. On the other hand, estimates for Liberal economies show that self-employed workers residing in intermediate areas spend less time in paid work than similar self-employed workers in urban or rural areas, with this difference not operating among employees. Estimates for Mediterranean countries are robust to the pooled results, and results for Social-democratic countries show that self-employed workers in urban areas spend less time in market work activities than similar self-employed workers in rural and intermediate areas. In Former USSR countries, results indicate that the self-employed residing in urban and intermediate areas spend less time working than similar self-employed workers in rural areas. Finally, for the remaining unclassified economies, estimates show that self-employed workers in urban areas spend more time in market work than do the self-employed in rural and intermediate areas.

6. Conclusions

This paper analyses the relationships among the urbanization level of the area of residence of workers, self-employment status, and employment outcomes (i.e., earnings and market work time) in 35 European countries, using data from the EWCS for the year 2015. Despite

that self-employment is a complex phenomenon that has attracted research attention in recent years, so far the relationships among urban forms, self-employment, market work hours, and earnings have been overlooked in the literature. Our results show that individuals in rural areas are more likely to be self-employed workers than workers in urban or intermediate areas. We report some degree of heterogeneity in these results, as they do not hold for workers in Social-democratic economies, where there are no differences in the probability of being self-employed depending on the urbanization level. Despite that, results show that workers in urban and intermediate areas make higher monthly earnings than similar workers in rural areas, and the difference depending on urbanization levels is even larger among the self-employed. However, this result seems not to be valid for workers in Liberal countries, Mediterranean countries, Social-democratic countries, and former USSR countries. Finally, our results reveal that, overall, self-employed workers spend more time in market work activities than do employees. Furthermore, in some economies, we report differences in the market work time of the self-employed (but not of employees), in terms of the urban form of the area of residence.

The analysis has certain limitations. For instance, we only use data from the 2015 wave of the EWCS, as previous waves do not include information on several variables, including urbanization levels. Similarly, since the EWCS is a cross-sectional database, we are subject to reverse causality and worker unobservable heterogeneity, and our results may be subject to spurious correlations and endogeneity. Then, estimates represent conditional correlations only, and not causal links. Even when we partially control for country-specific characteristics by including country fixed effects, results by country groups suggest the existence of heterogeneity in the analyzed correlations across countries. Given that country sample sizes are relatively small for certain countries, we could not provide detailed by-country estimates of the correlations of interest.

Despite these limitations, several conclusions can be derived from the analysis and considered by planners. There is a growing interest in promoting self-employment in European countries, given its positive impact on innovation and, ultimately, on development and economic growth. At the same time, several rural regions are facing depopulation processes related to difficulties in job access. In that context, self-employment is a key mechanism to compensate for the difficulty of developing rural areas. Although this article constitutes a starting point, the results suggest that self-employment is a promising tool to address depopulation in these areas, despite the fact that self-employed workers in rural areas seem to face worse conditions than self-employed workers in urban areas. Specific policies

addressing such limitations could help in the fight against depopulation. However, more theoretical and empirical research is needed to shed light on the question of how the geographical environment affects self-employment. In addition, self-employment policies should consider the relationship between the place of residence, and self-employment outcomes, because workers in rural locations may be spatially constrained. It is also important to identify those determinants that encourage self-employment in rural areas, in order to provide a better understanding of how to promote self-employment effectively in those regions. The analysis of such determinants is left for future research.

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Table 1. Composition of sample, by country

Country	N. Individuals	Percentage
Albania	910	2.38
Austria	916	2.4
Belgium	2,298	6.02
Bulgaria	974	2.55
Croatia	836	2.19
Cyprus	966	2.53
Czech Republic	858	2.25
Denmark	842	2.2
Estonia	822	2.15
Finland	896	2.35
France	1,431	3.75
FYROM	846	2.21
Germany	1,767	4.63
Greece	947	2.48
Hungary	841	2.2
Ireland	935	2.45
Italy	1,142	2.99
Latvia	772	2.02
Lithuania	899	2.35
Luxembourg	933	2.44
Malta	960	2.51
Montenegro	812	2.13
Netherlands	912	2.39
Norway	915	2.4
Poland	877	2.3
Portugal	804	2.1
Romania	906	2.37
Serbia	759	1.99
Slovakia	870	2.28
Slovenia	1,380	3.61
Spain	3,117	8.16
Sweden	918	2.4
Switzerland	902	2.36
Turkey	1,760	4.61
United Kingdom	1,480	3.87
Pooled sample	38,203	100

The sample (2015 EWCS) is restricted to employed and self-employed workers.

Table 2. Summary statistics, by employment status

	Self-employed		Employees		Difference	
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	*p-value*
Demographics						
Age	45.208	11.142	41.970	11.506	3.238	(<0.01)
Being male	0.622	0.485	0.480	0.500	0.142	(<0.01)
Primary education	0.259	0.438	0.155	0.362	0.104	(<0.01)
Secondary education	0.452	0.498	0.494	0.500	-0.042	(<0.01)
University education	0.289	0.453	0.351	0.477	-0.062	(<0.01)
Living in couple	0.724	0.447	0.649	0.477	0.075	(<0.01)
Family size	3.075	1.390	2.871	1.292	0.204	(<0.01)
N. children < 5	0.130	0.400	0.136	0.401	-0.006	(0.289)
N. children 5-17	0.512	0.862	0.459	0.805	0.053	(<0.01)
Employment attributes						
Work hours	43.531	17.437	38.252	10.991	5.279	(<0.01)
Full time	0.810	0.392	0.817	0.387	-0.007	(0.240)
Public sector	0.018	0.134	0.285	0.451	-0.267	(<0.01)
Earnings	1.408	1.161	1.368	0.883	0.040	(<0.01)
Urbanisation level						
Urban area	0.376	0.484	0.431	0.495	-0.055	(<0.01)
Intermediate area	0.250	0.433	0.301	0.459	-0.051	(<0.01)
Rural area	0.374	0.484	0.268	0.443	0.106	(<0.01)
N. Observations	5,942		32,261			

Notes: The sample (2015 EWCS) is restricted to employed and self-employed workers. Work hours are defined in hours per week. Earnings are net earnings, measured in Euros per month, divided by 1,000. Differences computed as the mean value for the self-employed, minus the mean value for employees. T-type test p-values for the differences in parentheses.

Table 3. Summary statistics, by urbanization level

	Rural areas		Intermediate/urban areas		Difference	
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	*p-value*
Demographics						
Age	43.384	11.340	42.109	11.558	1.275	(<0.01)
Being male	0.511	0.500	0.499	0.500	0.012	(0.027)
Primary education	0.206	0.405	0.158	0.364	0.048	(<0.01)
Secondary education	0.535	0.499	0.468	0.499	0.067	(<0.01)
University education	0.259	0.438	0.374	0.484	-0.115	(<0.01)
Living in couple	0.704	0.456	0.643	0.479	0.061	(<0.01)
Family size	3.103	1.342	2.823	1.289	0.280	(<0.01)
N. children < 5	0.139	0.409	0.133	0.398	0.006	(0.229)
N. children 5-17	0.512	0.854	0.449	0.797	0.063	(<0.01)
Employment attributes						
Self-employed	0.204	0.403	0.136	0.343	0.068	(<0.01)
Work hours	39.343	12.791	38.965	12.194	0.378	(<0.01)
Full time	0.807	0.395	0.819	0.384	-0.012	(<0.01)
Public sector	0.248	0.432	0.241	0.428	0.007	(0.199)
Earnings	1.256	0.884	1.419	0.938	-0.163	(<0.01)
N. Observations	10,871		27,332			

Notes: The sample (2015 EWCS) is restricted to employed and self-employed workers. Work hours are defined in hours per week. Earnings are net earnings, measured in Euros per month, divided by 1,000. Differences computed as the mean value for workers in rural areas, minus the mean value for workers in intermediate/urban areas. T-type test p-values for the differences in parentheses.

Table 4. Pooled estimates

VARIABLES	(1) Self-employment	(2) Earnings	(3) Work hours
Urban area	-0.067***	60.968***	-0.419*
	(0.008)	(17.834)	(0.223)
Intermediate area	-0.066***	37.149**	-0.086
	(0.008)	(17.375)	(0.225)
Self-employed	-	51.177	3.194***
		(44.680)	(0.672)
Interactions: Self-employed X			
Urban area	-	226.113***	0.749
		(71.110)	(0.883)
Intermediate area	-	250.617***	-0.514
		(74.402)	(0.980)
Controls			
Being male	0.039***	335.792***	1.864***
	(0.006)	(15.124)	(0.188)
Age	0.002	36.216***	0.278***
	(0.002)	(4.589)	(0.064)
Age squared	0.004	-29.768***	-0.364***
	(0.002)	(5.612)	(0.075)
Secondary ed.	-0.043***	215.833***	-0.304
	(0.009)	(18.017)	(0.268)
University ed.	-0.001	722.470***	-1.082***
	(0.010)	(24.329)	(0.304)
Living in couple	0.006	119.225***	0.216
	(0.007)	(16.504)	(0.216)
Family size	0.003	-34.045***	0.144
	(0.003)	(7.580)	(0.124)
N. children < 5	0.019**	63.218***	-0.153
	(0.008)	(18.404)	(0.250)
N. children 5-17	0.012**	53.411***	-0.226
	(0.005)	(12.161)	(0.179)
Full time	0.010	597.676***	14.241***
	(0.008)	(17.139)	(0.267)
Public sector	-0.180***	-20.893	-2.197***
	(0.005)	(17.312)	(0.200)
Earnings	-	-	0.002***
			(0.000)
Constant	0.186***	-1,223.810***	22.856***
	(0.053)	(97.540)	(1.470)
Country F. E.	Yes	Yes	Yes
Observations	38,203	32,750	32,750
R-squared	0.124	0.397	0.427

Notes: Robust standard errors in parentheses. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in Column (1), net monthly earnings in Column (2), and weekly work hours in Column (3). Estimates computed using sample weights. Age squared is defined as age2/100. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table 5. By welfare regime estimates

COUNTRY	(1) Conservative	(2) Liberal	(3) Mediterranean	(4) Social-dem.	(5) Post-comm.	(6) Former USSR	(7) Other countries
A. Self-employment model							
Urban area	-0.008	-0.059**	-0.093***	-0.008	-0.074***	-0.047***	-0.188***
Intermediate area	-0.032**	-0.074***	-0.064***	-0.005	-0.071***	0.007	-0.124***
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,257	3,317	6,010	3,571	5,256	2,493	9,299
R-squared	0.059	0.090	0.117	0.091	0.066	0.101	0.259
B. Earnings model							
Urban area	77.828**	-3.654	-10.379	72.425*	67.845***	52.670	155.129***
Intermediate area	24.382	18.663	19.281	6.944	-40.285*	-21.645	67.335**
Self-employed	-57.073	317.786	-17.143	135.903	235.989***	344.739**	43.244
Interactions: Self-employed X							
Urban area	281.274*	-34.228	211.608*	-68.522	355.802**	223.102	259.447***
Intermediate area	435.979**	154.130	150.608	-182.088	121.575	-74.125	111.028
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,482	2,863	4,534	3,464	3,948	2,315	8,144
R-squared	0.367	0.369	0.331	0.284	0.259	0.222	0.308
C. Work hours model							
Urban area	-0.752**	-0.735	0.312	0.196	0.388	0.792	0.044
Intermediate area	0.113	-0.169	-0.379	-0.049	0.768	1.061	0.198
Self-employed	7.061***	3.047	2.820**	6.732***	4.911**	6.952***	-1.175
Interactions: Self-employed X							
Urban area	-3.652***	-0.738	-0.222	-6.251**	0.373	-5.419**	7.183***
Intermediate area	-2.248	-4.688*	-0.329	-0.037	-3.232	-8.442***	1.257
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,482	2,863	4,534	3,464	3,948	2,315	8,144
R-squared	0.567	0.507	0.413	0.384	0.180	0.247	0.222

Notes: Robust standard errors available upon request. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in the self-employment model, net monthly earnings in the earnings model, and weekly work hours in the work hours model. Estimates computed using sample weights. Additional coefficients available upon request. All estimates include country fixed effects. Conservative welfare regime includes: Austria, Belgium, France, Germany, Luxembourg and Netherlands, Social-Democratic: Denmark, Finland, Norway and Sweden, Liberal: Ireland, Switzerland and United Kingdom, Former-USSR: Estonia, Latvia and Lithuania, Post-Communist: Bulgaria, Croatia, Czech Republic, Hungary, Poland and Slovakia, Mediterranean: Greece, Spain, Italy and Portugal, Others: Albania, Cyprus, Malta, Romania, Slovenia, FYROM, Turkey, Montenegro and Serbia. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Appendix A: Additional results

Table A1. Variable definition

VARIABLES	Definition in the EWCS survey
Age	Respondent's age at the time of the interview.
Being male	1 If the respondent is male; 0 otherwise.
Primary ed.	1 If the respondent has achieved primary education; 0 otherwise.
Secondary ed.	1 If the respondent has achieved secondary education; 0 otherwise.
University ed.	1 If the respondent has achieved university studies; 0 otherwise.
Living in couple	1 If the respondent lives with a couple; 0 otherwise.
Family size	Number of members in the respondent's household unit (included).
N. children < 5	Number of children present in the household whose age is less than 5 years old.
N. children 5-17	Number of children present in the household unit whose age is between 5 and 17 years old.
Self-employed	1 If the respondent is self-employed; 0 otherwise.
Full time	1 If the respondent is a full-time worker; 0 otherwise.
Public sector	1 If the respondent is a public sector worker; 0 otherwise.
Urban area	1 If the respondent lives in an urban area; 0 otherwise.
Intermediate area	1 If the respondent lives in an intermediate urban area; 0 otherwise.
Rural area	1 If the respondent lives in a rural area; 0 otherwise.
Supervision 1-9	1 If the respondent is in charge of between 1 and 9 workers; 0 otherwise.
Supervision 10+	1 If the respondent is in charge of more than 10 workers; 0 otherwise.
Work hours	Time in hours that the respondent normally spends working in his or her main paid job.
Earnings	Net monthly income from the main job of the respondent (after tax and social security contributions), expressed in Euros.

Table A2. Robustness checks

VARIABLES	(1) Self-employment	(2)	(3)	(4) Earnings	(5)	(6)	(7) Work hours	(8)
	Probit	Logit	Private sector	Full-time workers	Additional controls	Private sector	Full-time workers	Additional controls
Urban area	-0.286***	-0.530***	45.745**	71.693***	63.605***	-0.550**	-0.161	-0.386*
	(0.035)	(0.063)	(21.797)	(20.556)	(17.182)	(0.261)	(0.240)	(0.221)
Intermediate area	-0.277***	-0.511***	27.685	37.847*	42.435**	-0.084	-0.119	-0.044
	(0.037)	(0.065)	(20.698)	(19.991)	(16.873)	(0.261)	(0.245)	(0.224)
Self-employed	-	-	38.048	13.403	24.717	2.663***	3.545***	2.971***
			(44.977)	(49.008)	(43.457)	(0.689)	(0.740)	(0.673)
Self-employed X								
Urban area	-	-	250.558***	301.268***	213.569***	1.039	2.018**	0.744
			(72.258)	(81.111)	(68.650)	(0.902)	(0.946)	(0.876)
Intermediate area	-	-	273.613***	318.711***	229.983***	-0.510	0.757	-0.573
			(75.354)	(84.147)	(71.518)	(0.983)	(1.069)	(0.978)
Constant	-1.581***	-2.800***	-1,166.910***	-719.721***	-1,085.109***	22.923***	40.786***	23.165***
	(0.226)	(0.414)	(111.428)	(113.863)	(95.175)	(1.657)	(1.621)	(1.469)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	No	No	Yes
Country F. E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,203	38,203	24,551	26,651	32,750	24,551	26,651	32,750
R-squared	0.154	0.156	0.396	0.380	0.430	0.441	0.162	0.431

Notes: Robust standard errors in parentheses. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in Columns (1-2), net monthly earnings in Columns (3-5), and weekly work hours in Columns (6-8). Estimates computed using sample weights. Age squared is defined as age2/100. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table A3. By-country estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
COUNTRY	Belgium	Bulgaria	Czech R.	Denmark	Germany	Estonia	Greece	Spain	France
A. Self-emp. model									
Urban area	0.038	-0.001	0.025	-0.007	0.001	-0.022	-0.206***	-0.090***	-0.006
Intermediate area	-0.001	-0.026	-0.035	-0.042**	-0.030	-	-0.022	-0.054**	-0.028
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,298	974	858	842	1,767	822	947	3,117	1,431
R-squared	0.080	0.094	0.078	0.062	0.084	0.100	0.200	0.102	0.045
B. Earnings model									
Urban area	106.269**	137.601***	193.279***	63.239	105.328*	-113.729**	108.155*	34.227	43.330
Intermediate area	65.588**	-40.193	-0.551	14.093	72.408	-	12.576	21.542	-9.169
Self-employed	131.951	113.866	819.800***	430.139	-88.893	892.495*	15.133	-109.154	-11.641
Interactions: Self-employed X									
Urban area	-253.070	261.469	-51.063	100.877	662.204***	-641.518	193.479	502.073	-119.284
Intermediate area	-161.897	406.552**	-78.226	660.019	593.455**	-	269.429**	257.840*	549.134
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,075	826	627	814	1,576	737	732	2,376	1,383
R-squared	0.336	0.298	0.424	0.325	0.439	0.325	0.270	0.316	0.322
C. Work hours model									
Urban area	-0.992*	-0.070	-2.039**	-0.612	-0.824*	-0.398	-4.349**	-0.435	-1.021**
Intermediate area	-0.003	0.515	-0.368	-1.501**	-0.123	-	-4.401**	-0.832	0.306
Self-employed	15.114***	0.756	0.894	8.523***	4.426***	4.888**	2.626	2.443	7.442***
Interactions: Self-employed X									
Urban area	-4.563	-1.313	-0.739	-5.341	-1.521	-3.968	0.981	3.416*	-2.630
Intermediate area	-5.949**	-1.505	-6.549	-0.038	-0.263	-	1.057	1.910	0.749
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,075	826	627	814	1,576	737	732	2,376	1,383
R-squared	0.492	0.220	0.263	0.445	0.642	0.327	0.360	0.434	0.461

Notes: Robust standard errors available upon request. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in the self-employment model, net monthly earnings in the earnings model, and weekly work hours in the work hours model. Estimates computed using sample weights. Additional coefficients available upon request. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table A3 (*Cont.*). By-country estimates

COUNTRY	(10) Ireland	(11) Italy	(12) Cyprus	(13) Latvia	(14) Lithuania	(15) Luxemb.	(16) Hungary	(17) Malta	(18) Netherlands
A. Self-emp. model									
Urban area	-0.055*	-0.071**	0.001	-0.038	-0.068**	0.022	0.012	0.019	-0.066
Intermediate area	-0.094***	-0.051	-0.023	0.012	-	-0.039**	0.048	-0.021	-0.097**
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	935	1,142	966	772	899	933	841	960	912
R-squared	0.179	0.128	0.077	0.095	0.120	0.117	0.066	0.111	0.059
B. Earnings model									
Urban area	166.704***	23.181	15.515	87.735**	165.162*	-316.359***	109.284**	-5.051	20.155
Intermediate area	-9.670	32.584	-15.471	-72.677*	-	-226.679***	103.324**	17.697	46.956
Self-employed	6.938	127.897	345.387*	-78.724	441.895**	-702.010***	174.358	-148.581	38.188
Interactions: Self-employed X									
Urban area	157.552	2.176	-299.586	572.871***	294.871	385.232	-88.024	545.380	52.626
Intermediate area	241.148	43.428	-213.777	350.350	-	890.278**	149.617	259.867	0.134
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	824	799	916	723	855	778	449	876	829
R-squared	0.353	0.416	0.279	0.286	0.168	0.512	0.178	0.291	0.394
C. Work hours model									
Urban area	1.414	1.678	1.219	-0.679	2.555***	1.308	4.183***	-1.078	0.656
Intermediate area	0.432	0.041	1.435*	0.835	-	0.737	1.249	-0.021	0.924
Self-employed	6.884***	1.694	5.620**	4.752*	9.313***	10.424***	1.364	0.615	7.418***
Interactions: Self-employed X									
Urban area	-9.295***	-2.417	-5.325*	-6.105	-7.385**	-6.422	2.791	2.914	-6.534**
Intermediate area	-2.677	-0.004	-6.208*	-8.003**	-	-0.889	1.897	4.503	-6.469**
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	824	799	916	723	855	778	449	876	829
R-squared	0.476	0.441	0.347	0.289	0.254	0.487	0.192	0.402	0.651

Notes: Robust standard errors available upon request. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in the self-employment model, net monthly earnings in the earnings model, and weekly work hours in the work hours model. Estimates computed using sample weights. Additional coefficients available upon request. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table A3 (*Cont.*). By-country estimates

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
COUNTRY	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	UK
A. Self-emp. model									
Urban area	0.003	-0.173***	-0.136**	-0.120***	0.014	-0.004	-0.036	-0.011	-0.080***
Intermediate area	-0.042*	-0.164***	-0.109***	-0.076**	0.005	-0.015	0.011	-0.004	-0.099***
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	916	877	804	906	1,380	870	896	918	1,480
R-squared	0.078	0.107	0.171	0.161	0.099	0.081	0.131	0.073	0.091
B. Earnings model									
Urban area	-23.213	82.543*	-180.409	152.057***	157.752***	111.791**	73.348	62.950	-60.424
Intermediate area	15.175	-11.175	-88.392	133.965***	67.175	-14.846	-9.012	23.818	-16.496
Self-employed	-208.538**	58.680	-8.873	139.217	79.058	326.871***	226.401	-106.176	484.730
Interactions: Self-employed X									
Urban area	427.816*	759.055**	114.355	46.377	-40.227	-214.282	-202.117	-197.262	-204.966
Intermediate area	364.034	193.021	-189.870	-243.536**	-192.196	-33.906	-274.975	-295.438	-16.191
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	841	658	627	729	1,181	721	867	891	1,299
R-squared	0.390	0.287	0.402	0.314	0.242	0.297	0.275	0.248	0.319
C. Work hours model									
Urban area	0.176	1.939	-3.893	-0.035	1.975**	-1.997**	0.680	0.850	-1.020
Intermediate area	0.588	2.388	0.251	-2.871**	-0.191	-0.522	-0.635	0.657	-0.252
Self-employed	14.274***	7.988**	2.251	6.262***	7.793***	3.250	12.647***	2.506	0.539
Interactions: Self-employed X									
Urban area	-13.946***	3.890	0.608	-16.703***	-4.088	-4.027	-11.644***	-3.836	1.738
Intermediate area	-9.138*	-5.102	-3.522	-8.202	-2.275	2.075	-6.516	6.248	-3.911
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	841	658	627	729	1,181	721	867	891	1,299
R-squared	0.612	0.216	0.320	0.176	0.276	0.194	0.386	0.328	0.513

Notes: Robust standard errors available upon request. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in the self-employment model, net monthly earnings in the earnings model, and weekly work hours in the work hours model. Estimates computed using sample weights. Additional coefficients available upon request. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

Table A3 (*Cont.*). By-country estimates

COUNTRY	(28) Croatia	(29) FYROM	(30) Turkey	(31) Norway	(32) Albania	(33) Montenegro	(34) Switzerland	(35) Serbia
A. Self-emp. model								
Urban area	-0.033	-0.009	-0.248***	-0.013	-0.258***	-0.050	0.041	-0.095**
Intermediate area	-0.055**	-	-0.178***	-0.046	-	0.005	0.043	0.002
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	836	846	1,760	915	910	812	902	759
R-squared	0.100	0.271	0.255	0.098	0.402	0.281	0.092	0.219
B. Earnings model								
Urban area	46.587	133.982***	147.117***	119.565	70.089**	-75.403*	336.719***	237.357***
Intermediate area	61.564	-	-4.043	0.824	-	-36.867	218.880*	108.796***
Self-employed	63.268	-16.601	16.339	-21.909	4.592	15.489	-817.918**	58.232
Interactions: Self-employed X								
Urban area	234.989	-40.047	328.836***	215.275	140.275**	57.353	1,359.07**	-75.412
Intermediate area	-352.586***	-	248.963*	286.060	-	57.212	1,280.08***	23.977
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	734	1,627	892	797	708	740	576
R-squared	0.225	0.135	0.269	0.358	0.224	0.277	0.420	0.262
C. Work hours model								
Urban area	-1.809	-0.067	1.503	-0.938	1.407	-0.637	-0.293	-1.362
Intermediate area	-1.817	-	3.405**	0.593	-	-1.340	-0.148	0.912
Self-employed	-1.341	3.085	-1.778	0.308	2.446	0.311	16.286***	-1.737
Interactions: Self-employed X								
Urban area	1.176	0.695	8.610***	-1.452	4.189	-6.767**	-9.885	0.197
Intermediate area	5.002	-	-1.614	-2.297	-	-1.847	-10.043	7.058
All controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	734	1,627	892	797	708	740	576
R-squared	0.132	0.248	0.227	0.509	0.318	0.298	0.575	0.233

Notes: Robust standard errors available upon request. The sample (2015 EWCS) is restricted to employed and self-employed workers. The dependent variable is the self-employed dummy in the self-employment model, net monthly earnings in the earnings model, and weekly work hours in the work hours model. Estimates computed using sample weights. Additional coefficients available upon request. * Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.