

POVERTY AND MATERIAL DEPRIVATION AMONG THE SELF-EMPLOYED IN EUROPE: AN EXPLORATION OF A RELATIVELY UNCHARTED LANDSCAPE

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Abstract

In work-poverty has become a pressing social issue in Europe. The self-employed remain relatively uncharted terrain in this context. With about 15 percent of European workers in self-employment this group can no longer be ignored, especially since self-employment is on the rise in many countries, particularly own-account self-employment. Drawing on EU-SILC data this paper provides a systematic mapping exercise of poverty and living standards among the self-employed in the European Union.

We find that the self-employed in Europe generally face significantly higher income poverty risks than contracted workers. Looking in more detail at the drivers of income poverty among the self-employed we find that in addition to lower reported earnings, lower overall work-intensity at the household level appears to be an important driver.

However, while income poverty levels are quite significant among the self-employed, material deprivation rates are generally much lower. The discrepancy between income poverty measures and material deprivation measures is much larger for the self-employed than it is for employees. One possible explanation is that the self-employed can more often draw on assets accumulated over the life cycle or on business assets they control.

The self-employed constitute a very mixed segment of the workforce and within-group inequality is quite significant. One group emerges as being particularly at-risk of poverty are own-account workers, substantiating worries about the rise of this form of self-employment.

While the paper offers extensive descriptive analysis and some tentative explanations, an important and sizable research agenda remains.

JEL codes: I32, I38, J21, J22, L26

Keywords: In-work poverty, Material Deprivation, Self-employment, Europe

Introduction

In-work-poverty has become a pressing social issue in Europe. There is a good deal of research on poverty among contracted workers, including people in part-time or temporary employment (Horemans, 2017; Lohmann & Marx, 2018).

There is one important segment of the workforce about whom relatively little still is known: the self-employed. Yet with about 15 percent of all European workers in self-employment, this group can no longer be ignored, especially since self-employment is on the rise in many countries, particularly own-account self-employment. Drawing on EU-SILC data for a large set of European countries, this paper provides a first systematic mapping exercise of poverty and living standards among the self-employed in Europe.

This paper integrates the existing research on self-employment with the research on in-work poverty. This is important because much of the existing research on entrepreneurship and self-employment focuses on individuals (Carter, 2011), largely ignoring the household context. However, for analyzing in-work poverty this is of the essence. In addition to inadequate earnings, low (household) work-intensity and a high number of dependents relative to earners are key mechanisms resulting in higher in-work poverty risks (Crettaz, 2013; Marx & Nolan, 2014). So we need to consider these factors.

The paper proceeds as follows. The first part reviews research on in-work poverty and its known drivers. Then we discuss the renewed attention for self-employed workers in academic research, highlighting that the self-employed are a mixed segment of the work force. Next we discuss measurement and data issues when studying the poverty among the self-employed. Using EU-SILC data we then provide a first descriptive overview of poverty and material deprivation among the self-employed. The subsequent sections explore: (4) the distinct profile of self-employed, (5) the relevance of particular in-work poverty drivers for self-employed workers, and (6) the overlap of income poverty and material deprivation measures.

1 in-work poverty

Academic research on in-work poverty in Europe emerged around the late 1990s (Marx & Verbist, 1998; Nolan & Marx, 2000). Much of this was driven by concerns about low-paid employment, which was perceived to be on the rise. By now it is well established that low pay and in-work poverty are clearly distinct phenomena (Maitre, Nolan, & Whelan, 2012; Marx & Nolan, 2014). Low earnings obviously contribute to in-work poverty but household composition and work-intensity at the household level as well as taxes and transfers should be taken into account as well. Key is the composition of overall household income package (Andress & Lohmann, 2008; Fraser, Gutiérrez, & Peña-Casas, 2011; Horemans, 2016; Marx & Nolan, 2014). As a consequence, various labour market institutions and social policies matter (Brady, Fullerton, & Cross, 2010; Lohmann, 2009).

The complexity of in-work poverty as phenomenon derives in part from it being a hybrid concept (Lohmann & Marx, 2018). Alternative approaches and different operational choices may result in substantial differences in the magnitude and structure of in-work poverty (for Europe, see: Ponthieux, 2010; for the US, see: Thiede, Lichter, & Sanders, 2015). Focusing on Europe, this paper builds on the commonly accepted

European indicators to measure income poverty and material deprivation (for a more detailed discussion see below).

While in-work poverty has multiple causes by definition, much attention has been going to the individual labour market situation as one of the key drivers. Increases in (involuntary) part-time work, temporary work and self-employment have caused concerns regarding in-work poverty (Crettaz, 2013; Herman, 2014; Marx, Horemans, Marchal, Van Rie, & Corluy, 2013). Research has been looking at temporary employment (Van Lancker, 2012, 2013) and part-time employment (Horemans, Marx, & Nolan, 2016; OECD, 2010) as two key forms of non-standard employment. Research shows that both segments typically face higher poverty risks than permanent workers with full-time contracts. The self-employed have been largely ignored in the academic debate (Crettaz, 2013). Hence, as a starting point to study poverty among the self-employed, we can draw on the lessons learned from the research on these other types of non-standard work.

Why do part-time and temporary workers face increased poverty risks? This is not easily answered as usually several mechanisms operate simultaneously (Horemans, 2017). It is often assumed that a lack of work, a pay penalty, or a combination of both factors are the main elements. These factors do play a substantial role. Clearly, low wages and a less than full realisation of one's working time potential results in lower annual earnings and more difficulties to make ends meet. Furthermore, low individual earnings, either because of low working hours or a low wage, are especially problematic when non-standard workers belong to a household where overall work-intensity is low (Horemans, 2017; Van Lancker, 2013). Therefore, if we want to study the poverty risk of self-employed, we need to look at two sides of the same coin (Crettaz, 2013). First, we need to take the socio-demographic profile characteristics of the self-employed into account. Second, we need to examine whether some in-work poverty mechanisms are particularly relevant for self-employed.

2 A renaissance of self-employment?

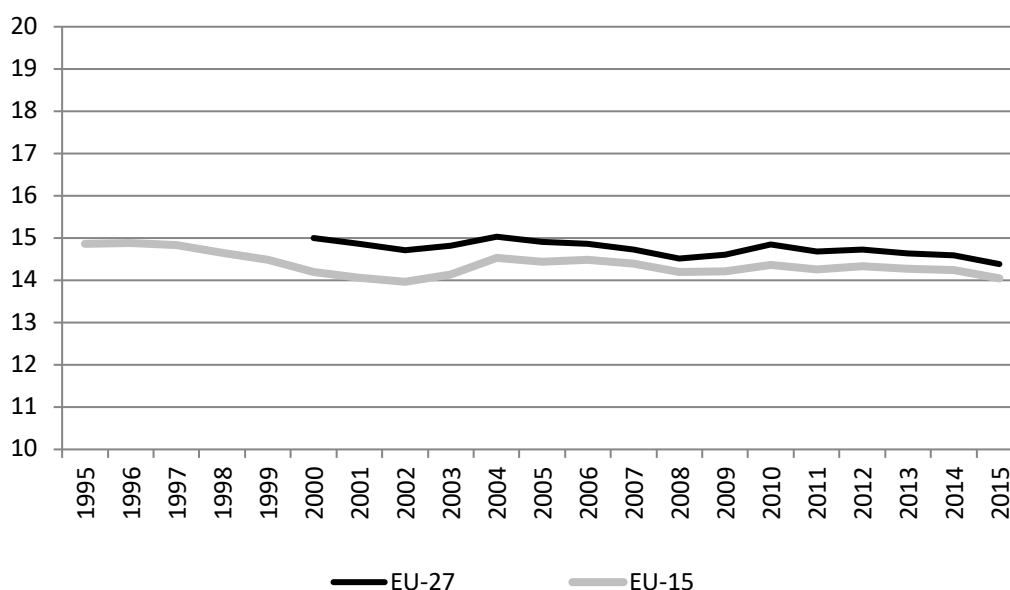
This section presents an overview of some key stylized facts and figures on self-employment and the various reasons why people work as self-employed. We show that it is difficult to approach the self-employed as a homogeneous group. Several considerations exist for workers to become self-employed and their outcomes may differ substantially. While self-employment has been shown to be on a rise in recent years, we argue that this evolution is limited to a particular type of self-employment: own-account workers, who tend to have lower earnings and higher levels of income volatility. Hence, we may expect that especially solo self-employed workers face particular high poverty risks across Europe. Yet, as we will show in the next section, the relationship between low individual earnings and poverty is far from straightforward.

2.1 Some facts and figures on self-employment

Basically, self-employed jobs are jobs ones where remuneration is directly dependent upon profits, and where incumbents make operational decisions or are responsible for the welfare of the enterprise (OECD, 2000). Conen, Schippers, and Buschoff (2016) witness a ‘renaissance of self-employment’ in recent years. Throughout the twentieth century self-employment gradually decreased. Blanchflower (2000), for example, shows that between 1966 and 1996 self-employment fell in most OECD countries, except in Iceland, New Zealand, Portugal and the UK. Yet in recent years the decline in self-employment has stagnated and it has even increased in some countries.

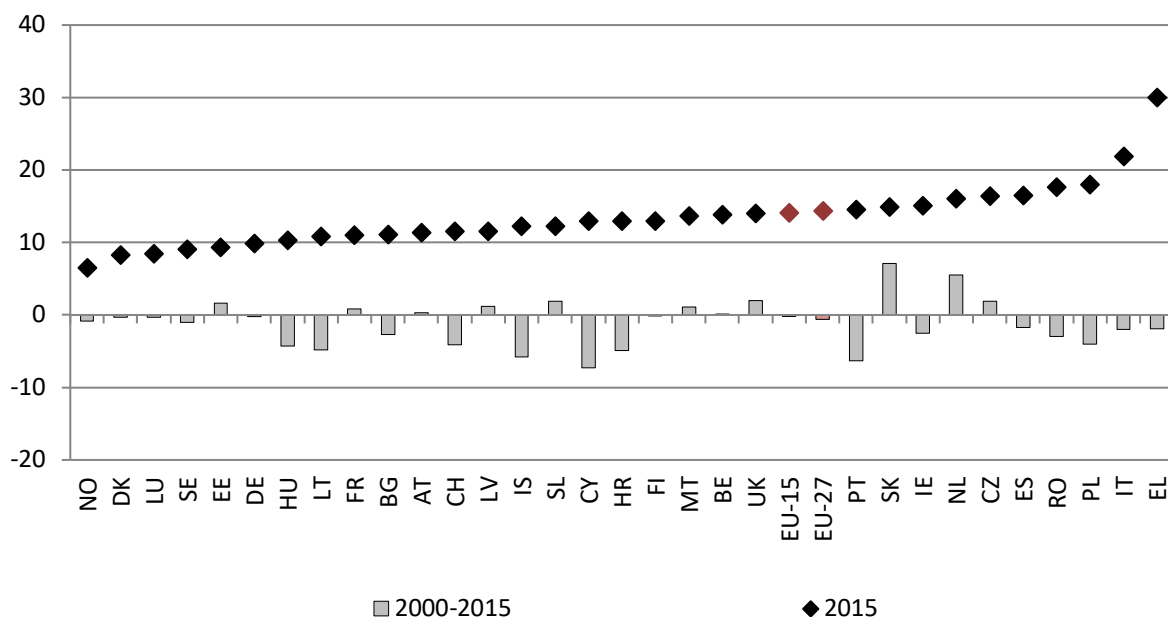
Indeed, looking at figure 1, we see that on average the share of self-employment in Europe remained around 14.5 percent the past twenty years. Figures for Europe, however, mask substantial cross-country variation as shown by figure 2. In several countries, namely Cyprus, Portugal, Iceland, Croatia, Lithuania, Hungary, Switzerland, Poland, Romania, Bulgaria, Ireland, Italy, and Greece self-employment decreased with about 2 percentage points or more between 2000 and 2015. In Slovenia, Czech Republic, the UK, the Netherlands, and Slovakia, self-employment went up by about two percentage points or more in the same period. In the UK, the growth in self-employment is linked to both structural and cyclical elements according to D'Acry and Gardiner (2014). One structural element in the UK story is postponement of retirement though self-employment, often in part-time jobs. Furthermore, the economic crisis pushed more people in self-employment jobs (D'Acry & Gardiner, 2014).

Figure 1. Evolution of the self-employment rate in the EU-15 and EU-27, 1995-2005 persons aged 20-64



Source: Eurostat: EU-LFS.

Figure 2. Self-employment rate 2015 and evolution of the self-employment rate 2000^(a)-2015, Europe, persons aged 20-64



Note: (a) data for Malta was only available for 2002.

Source: Eurostat: EU-LFS.

The self-employment rate varied in 2015 between 6.5 percent in Norway and 30 percent in Greece (figure 2). This substantial variation in self-employment rates across countries holds even when controlling for the sectoral composition of the economy (Torrini, 2005). A large agricultural sector and high levels of regional unemployment are likely to increase the share of self-employment. However, as van Es and van Vuuren (2011) indicate, changes in industrial composition can have an effect, but not necessarily in all countries in the same way. Socio-cultural trends and policies to foster self-employment have been in particular relevant in the Netherlands (Josten, Vlasblom, & Vrooman 2014; Mevissen & Van der Berg, 2011; van Es & van Vuuren, 2011). Since employment decisions are shaped by ever changing institutional contexts, various institutions, including legal regulations, industrial relations systems, taxation systems, as well as social policies can either ‘pull’ or ‘push’ individuals into self-employment (for a recent review article, see: Dawson & Henley, 2012; Hipp, Bernhardt, & Allmendinger, 2015).

2.2 Why do people become self-employed?

Risk taking behaviour and financial returns have traditionally been a central elements in economic models predicting transitions to self-employment as well as the earnings and the socio-demographic profile the self-employed (Simoes, Crespo, & Moreira, 2016). Lévesque and Minniti (2006), for example, argue that the age profile of people making a transition to self-employment depends on the interplay with wealth, ability and risk aversion. The potential future income gains in the long run are for obvious reasons higher for younger workers. Furthermore, people who do not yet have children are usually less risk averse. Yet, in empirical work an inverse U-shaped age profile is typically found for the self-employed since prime aged people have the experience to successfully manage a business as well as the financial backup to take the risk (Simoes et al., 2016).

Whether self-employment really pays is a question that remain somewhat unclear. The empirical evidence regarding the actual financial advantages of becoming self-employed is limited (Astebro & Chen, 2014; Hamilton, 2000). Matching and learning models claim that entrepreneurs enter on chance (MacDonald,

1988). As a consequence, many entrepreneurs with few abilities can cause average earnings to be lower compared to employee earnings. On the other hand, with only the successful remaining, we would expect average earnings to increase with tenure. Yet, the self-employed typically have a flatter earnings-tenure profile than employees (Astebro & Chen, 2014). Underreporting of income is one element that may explain the earnings difference between employees and self-employed and the flat life-time earnings profile of the latter (Astebro & Chen, 2014). Furthermore, part of the (financial) gains can sometimes be made through the company or result from past savings. Carter (2011), for example, argues that while self-employed are often found to face an earnings penalty, several studies indicate that self-employed are wealthier and have higher levels of household assets.

Non-pecuniary reasons can play an important role for some to become self-employed as well. Autonomy and working time flexibility - 'being your own boss' - contributes to a greater job satisfaction among the self-employed in general and some groups in particular (Álvarez & Sinde-Cantorna, 2014; Hamilton, 2000). For example, older workers who switch to self-employment have been shown to earn less, but declare a higher quality of life (Kautonen, Kilbler, & Minniti, 2017). Furthermore, some employees may deliberately switch to a self-employed status as an expert towards the end of their career to ease the transition to retirement. Older people typically have more human, financial and social capital to make the switch to self-employment successfully (Simoes et al., 2016). For women non-financial incentives, including traditional gender role patterns and difficulties combining work and care play a more important role, whereas for men financial incentives are more important (Dawson, Henley, & Latreille, 2009; Georgellis & Wall, 2005).

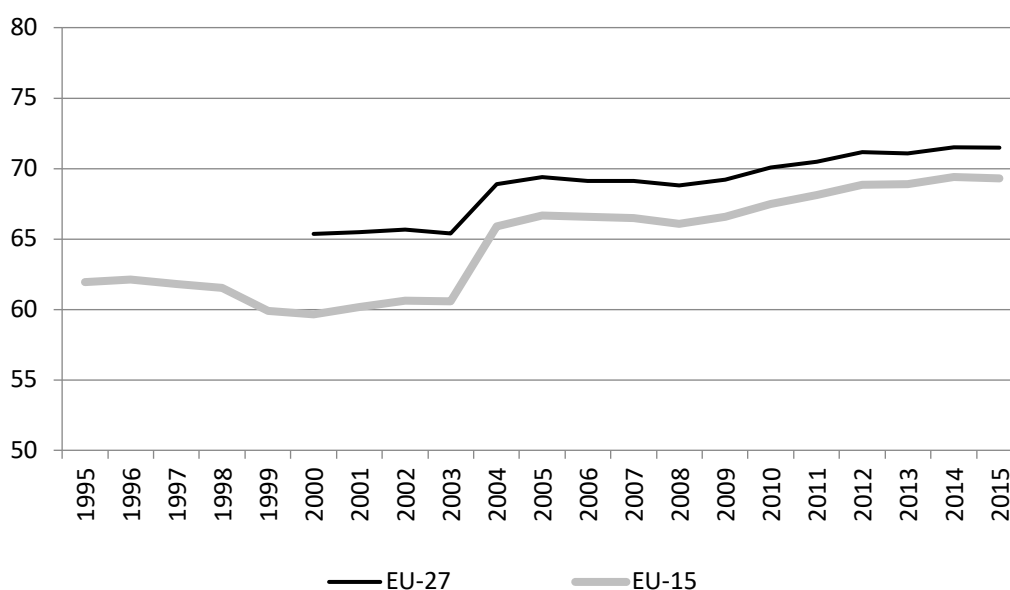
An important difference exists in the profile of 'risk-takers' who look for unique market opportunities and those who engage in self-employment activities out of 'necessity' (Reynolds, Camp, Bygrave, Autio, & Hay, 2002). For some workers self-employment is the only available option because they have few chances to find a standard job, like low skilled persons, or people with a migrant background (Andersson & Wadesjö, 2004; Joona, 2009; Sanders & Nee, 1996). It is not simply that all lower skilled persons become entrepreneurs out of necessity and a lack of other options as Block and Wagner (2010) show for Germany. Yet, Dawson et al. (2009) do indicate that the reasons for becoming self-employed are socially stratified in the UK. Their results show that for the higher educated self-employment offers independence and financial reward, as well as better working conditions. For the lower educated, the choice of self-employment is more likely to arise from a lack of alternative employment opportunities (Dawson et al., 2009).

The choice to become self-employed can also be inherent to a particular professional choice (Eurofound, 2010; Hatfield, 2015). For some self-employed jobs strong regulations exist. One may need a particular licence to perform independent activities, like lawyers or doctors. Other jobs are not (yet) regulated or deliberately deregulated to stimulate private sector self-employment growth. Craft workers, traders or farmers who often operate in a family business are also by tradition self-employed. Dawson et al. (2009), for example, show for the UK that one in five self-employed state that the nature of the occupation is why they work as self-employed and about seven percent joined a family business.

Taken as a whole, there is little evidence to speak of a real renaissance of self-employment across Europe. However, as should be clear by now the self-employed are not a homogeneous category. On the contrary, Arum and Müller (2004: 30) argue self-employment to be '*an increasingly heterogeneous activity with growth occurring in professional-managerial and unskilled occupations as opposed to traditional skilled, craft-based self-employment*'. The reasons why people become self-employed can be highly diverse and multiple factors play a role. 'Push' and 'pull' factors to self-employment and entrepreneurship are more ambiguous than often assumed and are not restricted to financial considerations (Dawson & Henley, 2012). Adding even more complexity, note that different groups may prioritize other elements that either pushes or pulls them to self-employment (Simoes et al., 2016).

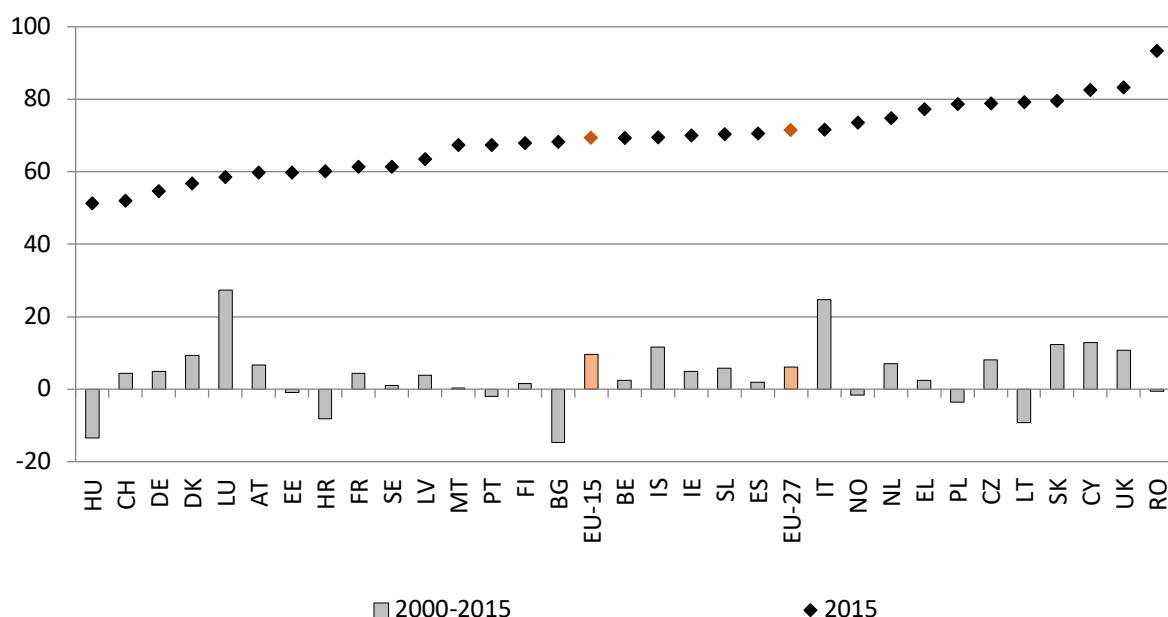
Several scholars claim to observe an increase in the numbers of the ‘forced’ solo self-employed. They have long remained under the radar as a social issue as they have, as independent workers, obviously difficulties to raise collective voice (Conen et al., 2016; Eurofound, 2010). A growing share of the self-employed operate in the grey area of own-account self-employment, while effectively being dependent on just one company (OECD, 2000, 2015). Employers may ‘push’ employees in ‘involuntary’ or ‘quasi’ self-employment to avoid costs and operate more efficiently in fast changing markets (Kautonen et al., 2010). Others stress the non-pecuniar benefits of being independent workers (Bruton , Ketchen, & Ireland, 2013; Fields & Pfeffermann, 2003), rendering lower earnings as an acceptable trade-off. Furthermore, a substantial share of workers combine self-employment with a regular job (Folta, Delmar, & Wennberg, 2010; Solesvik, 2017).

Figure 3. Evolution of the share of self-employed persons without employees among the self-employed, EU-15 and EU-27, 1995-2005, persons aged 20-64



Source: Eurostat: EU-LFS.

Figure 4. Share of self-employed persons without employees in 2015 and the evolution of the share of self-employed persons without employees among the self-employed 2000^(a)-2015, Europe, persons aged 20-64



Note: (a) data for Malta was only available for 2002.

Source: Eurostat: EU-LFS.

From figure 3 and 4 we clearly see that self-employed without employees, or ‘own-account workers’, have become a vast majority among the self-employed, ranging from 51.4 percent in Hungary, up to 93.4 percent in Romania. It is this group in particular that has been growing in most European countries. As with other forms of non-standard employment, institutional context, including tax incentives, employment protection legislation, the share of public sector employment, product market regulations (PMR) all affect the share and the specific profile of the self-employed (Baumann & Brändle, 2012; OECD, 2000; Torrini, 2005). Román, Congregado, and Millán (2013), for example, show that a higher unemployment rate is associated with more ‘last resort’ or ‘necessity’ self-employment, whereas entrepreneurship self-employment is higher in tighter labour markets.

In sum, drawing on the literature on the reasons to become self-employed, there is more to it than a simple dichotomy between on the one hand self-employed entrepreneurs out of choice and on the other hand own-account workers effectively pushed into self-employment. Contemporary self-employment should be understood in the context of broader societal changes where technological advances change the traditional standard employment relationship between employers and employees. Yet a key distinction can be made between self-employed persons with or without employees. It is this latter group for whom concerns are being raised regarding their social and income situation (Schulze Buschoff & Schmidt, 2009; Westerveld, 2012). According to Herman (2014) own-account workers and unpaid family workers in particular can be considered ‘vulnerable’ workers because they are more likely to face volatile earnings and are more likely to have become self-employed due to a lack of other options.

3 Concepts, measurement and data

3.1 Who is self-employed and who is poor?

In the literature on in-work poverty, various approaches have been used to measure the concept (Airio, 2008; Crettaz, 2011; Ponthieux, 2010; Thiede et al., 2015). The ‘in-work at-risk of poverty’ indicator published by Eurostat (Bardone & Guio, 2005) is now commonly used in Europe. People are considered at-risk of poverty when their annual equivalised household disposable income is below 60% of the national median (Dennis & Guio, 2003)¹. Individuals are considered to be ‘in-work’ when they declare to have been ‘employed’ for more than half the income reference period of one year. This definition of in-work poverty puts relatively much weight on overall household work-intensity as a driving factor (Marx & Nolan, 2014; Ponthieux, 2010). Note that the most precarious workers, those with volatile and marginal labour market attachment during the income reference period, are not included (Crettaz, 2011). On the other hand, as periods of not working (up to five months) are allowed to be considered ‘in-work’, it is possible that in-work poverty can be, at least partially, seen as an unemployment problem (Halleröd, Ekbrand, & Bengtsson, 2015).

The commonly used ‘in-work at-risk of poverty’ indicator draws on EU-SILC data, which is the main source of information for monitoring social exclusion and inequality in Europe. The reference population includes all private households and their current members residing in the territory of the countries at the time of data collection. All household members are surveyed, but only those aged 16 and more are interviewed (Eurostat, 2010). EU-SILC data collection follows a uniform framework with shared guidelines and procedures as well as common concepts and classifications aimed at maximising comparability of the data (Eurostat, 2011). Even with a common framework, the comparability of the data across countries is not perfect (for a detailed overview of problems with comparability, see: Lohmann, 2011; van Oorschot, 2013; Van Rie & Marx, 2011; Verma & Betti, 2011).

¹ The total household income is divided by its equivalent size using the so-called modified OECD equivalence scale. This scale gives a weight of 1.0 to the first adult, 0.5 to any other household member aged 14 and over and 0.3 to each child. The resulting figure is attributed to each member of the household, whether adult or children.

Figure 5. At-risk of poverty rate among the self-employed and the difference with the poverty risk of employees, 2015



Note : self-employed include self-employed with or without employees and family workers.

Source: Eurostat: EU-SILC_[ilc_li04].

Figure 5 shows the at-risk of poverty rate of self-employed people and the difference in the poverty risk between employees and self-employed drawing on Eurostat figures. We see that the at-risk of poverty rates of the self-employed vary considerably across Europe - from about 8 percent in Czech Republic and Hungary to more than 30 percent in Portugal, Estonia, and with Romania as an outlier. Looking at the relative position of self-employed vis-à-vis employees, it is clear that the former face a higher poverty risk in almost all countries. Hence, a higher share of self-employment results, *ceteris paribus*, in a higher in-work poverty rate in general (see also: Herman, 2014). From figure 1 we also see that in countries with higher at-risk of poverty rates for self-employed, the difference between employees and the self-employed are larger as well.

3.1.1 The self-employed poor: a genuine income problem or an income measurement problem?

For the self-employed particular problems exist when surveying and analysing income data (Eurostat, 2014; Verma & Betti, 2011). Accounting practices and tax regulations often make it difficult for self-employed to provide an accurate estimation in surveys like those used for EU SILC of their personal as opposed to their (incorporated) business income, which are often intertwined². In addition, the self-employed tend to be less likely to respond to income surveys. Their income variables are subjected to higher levels of item non-response as well as under-reporting (Astebro & Chen, 2014)³. Additional problems arise when self-employment is a secondary activity for employees (Eurostat, 2014). Because of the specific problems associated with income data for self-employed, we will also look at another indicator of poverty in this paper, namely ‘material deprivation’.

Material deprivation (MD) is often adopted complementary to the at-risk of (income) poverty (AROP) in Europe (Fusco, Guio, & Marlier, 2011). Both the income based AROP and the MD approach take Peter Townsend’s (1979: 31) notion of poverty as a starting point in that the poor have: ‘resources so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary

² In EU-SILC self-employment income also includes ‘Value of goods produced for own consumption’.

³ For a more detailed overview of item non-response among self-employed in EU-SILC, see: Verma and Betti (2011).

living patterns, customs and activities'. The main difference between AROP and MD is that the former focusses on one key resource, namely income. Deprivation indicators are another way to identify the poor by focussing on particular items people can afford that are needed to participate in society. However, little consensus exists as to which items should be included and why (Guio et al., 2016; Nolan & Whelan, 2010). In this paper we draw on the measurement MD as adopted by the European Commission and the member states in 2009 (Guio, 2009). Someone is considered materially deprived when living in a household that lacks 3 out of 9 items⁴.

Overall, the overlap between AROP and MD has been shown to be fairly limited (see for example: Hick, 2015b; Nolan & Whelan, 2011; Perry, 2002)⁵. Both measures are clearly associated, but the relationship is 'neither monotonic nor linear' (Fusco et al., 2011: 149). MD tends to be more influenced by long run drivers, like low education, health problems. It is also more linked to household needs and factors that influence spending power, like tenure cost.

MD and AROP have similar underlying risk factors, but apparently this is less so among the self-employed. They typically show a high AROP rates, but relatively low MD rates (Fusco et al., 2011; Hick, 2015a, 2015b). Sevä and Larsson (2015) show for Sweden that self-employed tend to have a higher AROP compared to employees, while the degree of MD does not differ significantly between both groups. Similarly, Hick (2015a) shows for the UK that the self-employed have a higher income poverty risk, whereas their material and non-material living standard does not appear inferior to that of employees. Self-employed even tend to face lower MD compared to employees in some countries (Fusco et al., 2011). Sevä and Larsson (2015) indicate that self-employed people who are income poor tend to have on average a higher living standard than poor employees in Sweden. This confirms the results of Bradbury (1997) who argues that income data represent a poor indicator of actual living standards among the self-employed. We will test this claim more in detail in the following section, but we first discuss how to cope with the heterogeneous nature of the self-employed when adopting EU-SILC data.

3.1.2 Self-employment and poverty: coping with heterogeneity

Recall that the self-employed are far from a homogeneous group (*supra*). Unfortunately little information on the specific type of self-employment or the reason why people work as self-employed is available in EU-SILC. However, to some extent we can distinguish between different types of self-employed. Three approaches can be adopted.

To make a distinction between self-employed persons and employees, the most simple method is to follow the Eurostat approach to define people 'in-work' (see above) and then look at people's current status in employment. With EU-SILC data we can make a further distinction between employees, self-employed persons with employees, self-employed persons without employees, and family workers. A second method is to take the self-declared activity status during all of the twelve months of the income reference period into account. Self-employed persons and employees are then defined as such when they declare to have

⁴ (1) afford one week annual holiday away from home; (2) face unexpected expenses; (3) avoid arrears (mortgage or rent, utility bills or hire purchase instalments); (4) afford a meal with meat, chicken, fish or vegetarian equivalent every second day; (5) afford to keep their home adequately warm; (6) afford to have a car/van for private use (if wanted); (7) afford to have a washing machine (if wanted); (8) afford to have telephone (if wanted); (9) afford to have a television (if wanted). Note that as one of the three sub-indicators to monitor the Europe 2020 strategy target to reduce poverty and social exclusion, 'severe' material deprivation (SMD) is adopted, indicating that people live in a household that lacks 4 out of 9 items.

⁵ Trends over time are also not necessarily consistent between the two measures (Hick, 2015b). The overlap between the indicators depends on the type of items included in the deprivation index. In want of life-style and daily use items, for example, is more correlated with income than household conditions and facilities, or neighborhood problems (Whelan, Layte, & Maître, 2004). Furthermore, consistent income poverty and consistent material deprivation over several years are more correlated than income poverty and material deprivation at one point in time (Whelan & Maître, 2008; Berthoud, Bryan & Bardasi, 2004).

been working only as either self-employed or as an employee, leaving a rest category of people ‘in-work’ but who combined employment situations during the past twelve months. These first two approaches also allow an additional distinction between part-time and full-time self-employed persons (see appendix 1). A third method is to look at income sources. Workers can, during the reference year, receive income from self-employment, as an employee, or both. Appendix 1 provides an overview of the composition of the working population by employment status when adopting these different approaches.

3.1.3 Control variables and models

In the next part of this paper we will first look at the poverty risks facing the self-employed, as compared to employees. We then turn to the question of why between both groups face different poverty risks. We do so by looking at the particular profile characteristics of both employees and self-employed people. Subsequently we estimate a series of logistic regression models predicting in-work at-risk of poverty (AROP) and in-work material deprivation (MD). By controlling for other factors, we examine whether particular profile characteristics explain the poverty differences between employees and the self-employed. Furthermore, by introducing interactions between work-status (self-employed or employee) with various individual, household and job characteristics, we gauge whether particular in-work poverty mechanisms work differently for the self-employed as compared to employees. Lastly, we focus on the overlap between income poverty and material deprivation. In the various models, we take individual level characteristics into account, including sex (2 categories: male or female), education level (3 categories: low, middle, and high skilled), age (3 categories: [18-29], [30-49], and [50-64]). We also control for family characteristics, like the children (4 categories: no children, 1, 2, or >2 children), family type (3 categories: single, couple, other), and work intensity of other household members (continuous between 0 and 1), and job characteristics, including low earnings (2 categories: yes or no), own work intensity (continuous between 0 and 1), and occupation (6 categories: based on ISCO-08 codes⁶).

3.2 A first description of the landscape

In this section we first examine the at-risk of poverty rates (AROP) and material deprivation (MD) rates of self-employed people in Europe as compared to employees. Tables 1 to 6 show the AROP and MD rates of workers by employment status as well as the significance levels of the differences based on conservatively calculated confidence intervals (Goedemé, 2013). Subsequently, we look at the macro-level correlations as well as micro-level overlaps between AROP and MD

3.2.1 Placing some first dots on the map: AROP and MD among employees and the self-employed

Table 1 distinguishes between the poverty risks of paid employees, self-employed persons with employees, self-employed persons without employees, and family workers. This approach is based on the current employment status of workers. Confirming earlier research, we see that the type of self-employment matters (Whelan et al., 2004). Self-employed persons without employees have significantly higher AROP rates compared to self-employed people with employees in more than half of the countries included. Family workers tend to face a particularly high AROP rates. However, given the low number of family workers in many countries (see appendix 1), we should be thoughtful about significance. Looking at MD in table 2, we see that the picture changes drastically. Now employees are generally not less likely to be MD compared to

⁶ ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

self-employed. Yet again, self-employed persons with employees face lower levels of MD compared to both employees and self-employed people without employees. Hence, the socio-economic position of the self-employed clearly differs by whether or not they employ additional workers themselves, which is obviously more common in successful businesses.

Table 1. At-risk of poverty rate among workers, by current employment status, individuals aged 18-64, 2014

	Employee	Self-employed with employee	(a)	Self-employed Without employee	(b)	(c)	Family worker	(d)	(e)	(f)
AT	6,3	7,1		17,1	***	**	25,3	(*)		
BE	3,7	12,9	**	13,9	***		29,4	**	(*)	(*)
BG	8,8	1,5	***	18,1	**	***	26,7		*	
CY	7,8	2,7	**	9,0		*	5,5			
CZ	2,9	5,0		7,5	***		15,9			
DE	8,6	14,3	*	23,7	***	**	57,9	**	**	*
DK	3,9	(-)		(-)			17,2	***		
EE	9,9	25,4	***	35,4	***	(*)	62,6	**	*	
EL	8,5	12,2		23,6	***	***	33,8	***	***	**
ES	10,1	19,1	***	26,6	***	**	31,2	*		
FI	2,2	6,7	**	15,8	***	***	16,3	(*)		
FR	6,4	16,5		21,0	***		46,3	**	*	*
HR	4,8	12,4	*	15,3	***		23,9			
HU	6,3	2,2	***	9,2		**	14,4			
IE	3,6	9,3	*	14,7	***	(*)	30,5	**	*	*
IS	3,4	12,5	**	18,7	***		(-)			
IT	8,5	14,8	***	21,6	***	**	17,0	**		
LT	7,6	9,7		16,2	**		24,0	(*)		
LU	10,1	23,7	*	24,0	**		47,7	*		
LV	7,2	7,8		23,1	***	***	65,4	***	***	**
MT	4,7	8,1		16,6	***	*	9,7			
NL	4,3	12,8	*	11,1	***		7,8			
N O	3,8	(-)		12,7	***		20,7			
PL	7,2	6,5		27,4	***	***	33,4	***	***	(*)
PT	7,9	33,6	***	30,0	***		26,6	(*)		
RO	6,4	15,3		57,2	***	***	60,7	***	***	
SE	6,6	14,0	**	23,4	***	*	(-)			
SI	4,4	15,3	***	25,4	***	**	43,3	***	**	(*)
SK	4,3	17,2	**	12,7	***		(-)			
UK	7,1	17,7	**	20,1	***		(-)			

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed with employee; (b) employees and self-employed without employee; (c) self-employed with employee and self-employed without employee; (d) employee and family worker; (e) self-employed with employees and family workers; and (f) self-employed without employees and family workers.

Source: EU-SILC 2014, own calculations.

Table 2. Material deprivation among workers, by current employment status, individuals aged 18-64, 2014

	Employee	Self-employed with employee	(a)	Self-employed without employee	(b)	(c)	Family worker	(d)	(e)	(f)
AT	6,3	3,5	(*)	4,1	(*)		5,0			
BE	6,3	0,9	***	3,9	*	**	3,5			
BG	32,4	8,4	***	33,6		***	29,4		(*)	
CY	30,7	44,5	*	41,3	**		62,1	*		
CZ	11,9	4,0	***	8,3	**	*	(-)			
DE	7,4	3,1	**	7,4		*	15,9			
DK	3,9	(-)		(-)			0,9	***		
EE	11,5	0,3	***	8,0	(*)	***	(-)			
EL	27,8	16,9	***	36,9	***	***	49,8	***	***	**
ES	12,1	7,9	*	12,5		*	17,9			
FI	3,8	1,5	***	4,4		**	2,4			
FR	8,5	4,5		12,0	(*)	*	4,7			(*)
HR	25,8	14,3	***	25,5		*	55,8	(*)	**	*
HU	33,6	8,8	***	16,3	***	***	19,2	*		
IE	13,7	3,9	***	12,8		**	14,4			
IS	3,6	6,7		2,7			(-)			
IT	17,3	9,3	***	19,9	(*)	***	15,1		(*)	
LT	17,3	9,4	(*)	17,4			20,5			
LU	4,0	0,7	***	3,6			(-)			
LV	26,2	6,9	***	28,8		***	29,8		(*)	
MT	14,1	11,6		11,0			17,5			
NL	5,7	2,3	*	4,7			(-)			
NO	1,9	(-)		1,9			9,9			
PL	15,8	4,7	***	17,6		***	18,0		***	
PT	19,3	13,0	*	21,8		*	15,0			
RO	29,9	13,3	***	59,6	***	***	60,5	***	***	
SE	1,8	0,9		1,8			(-)			
SI	12,7	4,7	***	12,0		***	10,8			
SK	15,1	2,3	***	11,8	*	***	(-)			
UK	9,7	1,9	***	9,7		***	(-)			

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed with employee; (b) employees and self-employed without employee; (c) self-employed with employee and self-employed without employee; (d) employee and family worker; (e) self-employed with employees and family workers; and (f) self-employed without employees and family workers.

Source: EU-SILC 2014, own calculations.

The second possibility to distinguish among the self-employed is to use the information on the self-declared most important employment status during each month of the income reference period. The number of months worked in a certain status is highly relevant in the context of in-work poverty as Horemans and Marx (2013) show for part-time workers. Overall, tables 3 and 4 confirm that employees - individuals declared to have been working only as an employee during the income reference period - are better off when looking at AROP, while this is not the case for MD. In most countries the difference in MD is not significant

between employees and self-employed. In fact, in Austria, Belgium, Czech Republic, Estonia, Malta, Hungary, Ireland, Luxembourg, and Slovakia, MD is lower for self-employed. Conversely, in Cyprus, Greece, Poland, and Romania employees are less likely to be materially deprived. The picture becomes even more diverse when looking at workers who combine employment statuses during the income reference period. While this again involves a small share of the workforce (see appendix 1), it does indicate strong variable patterns across Europe.

Table 3. At-risk of poverty rate among workers, by self-declared main employment status during income reference period, individuals aged 18-64, 2014

	Only employee	Only self-employed	(a)	Combination	(b)	(c)
AT	6,3	12,9	***	28,6	*	
BE	3,5	16,8	***	3,6		**
BG	8,7	20,5	***	26,3		
CY	7,7	8,4		8,5		
CZ	2,8	7,3	***	10,4		
DE	8,6	19,0	***	29,4	*	
DK	3,7	19,9	***	1,7		***
EE	9,7	30,5	***	35,3	*	
EL	8,5	23,7	***	3,2		***
ES	9,9	24,5	***	6,2		***
FI	2,1	13,3	***	11,7	**	
FR	6,4	19,4	***	8,9		
HR	4,8	14,6	***	6,6		
HU	6,4	7,1		11,7		
IE	3,9	14,0	***	(-)		
IS	3,7	12,0	***	24,3	**	(*)
IT	8,7	19,7	***	12,1		
LT	7,6	16,7	**	12,5		
LU	10,2	23,2	***	33,9		
LV	7,1	32,7	***	18,3		*
MT	4,7	14,2	***	7,1		
NL	4,1	13,0	***	13,9		
NO	4,7	11,5	***	23,4	*	
PL	7,2	21,4	***	15,9	**	(*)
PT	7,9	31,2	***	17,4	***	*
RO	6,3	57,2	***	32,8	(*)	
SE	6,7	20,7	***	11,1		
SI	4,0	25,9	***	13,1	*	**
SK	4,3	13,8	***	(-)		
UK	7,3	19,5	***	7,0		**

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed; (b) employees and combination; and (c) self-employed and combination.

Source: EU-SILC 2014, own calculations.

Table 4. Material deprivation among workers, by self-declared main employment status during income reference period, individuals aged 18-64, 2014

	Only employee	Only self-employed	(a)	Combination	(b)	(c)
AT	6,3	3,5	**	13,1		
BE	6,3	3,1	**	5,6		
BG	32,2	29,8		64,4	*	*
CY	30,7	43,3	***	39,2		
CZ	11,8	7,0	***	41,9	**	**
DE	7,4	6,5		14,2		
DK	4,0	5,0		(-)		
EE	11,5	5,4	***	6,8		
EL	28,0	34,6	**	5,5	***	***
ES	12,0	11,5		19,9		
FI	3,7	3,4		8,9	(*)	(*)
FR	8,7	10,6		49,8	(*)	(*)
HR	25,8	20,9	(*)	28,8		
HU	33,6	13,9	***	21,0		
IE	13,7	9,0	**	45,3	(*)	*
IS	3,6	2,2		8,9		
IT	17,6	16,2		15,5		
LT	17,4	15,1		6,4	**	(*)
LU	3,9	1,9	(*)	29,0		(*)
LV	26,2	27,1		17,8		
MT	14,1	11,3		15,5		
NL	5,5	5,4		8,0		
NO	2,2	1,5		(-)		
PL	15,9	21,0	***	11,9	(*)	***
PT	19,3	19,2		13,9		
RO	29,9	57,7	***	41,8		
SE	1,8	1,7		(-)		
SI	12,6	11,5		11,4		
SK	15,1	10,0	***	13,5		
UK	9,7	8,2		13,6		

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed; (b) employees and combination; and (c) self-employed and combination.

Source: EU-SILC 2014, own calculations.

The third approach to defining the self-employed is based on the income source during the income reference period. Note that compared to the second approach, a substantial share of the workforce tends to combine self-employment and employee activities during the income reference period (appendix A1.2 and A1.3). To study the ‘hybrid entrepreneurs’ (Folta et al., 2010; Solesvik, 2017), those who combine both statuses, the third approach is probably better. Yet, the drawback of EU-SILC data remains that we do not know whether self-employment and employee income was received simultaneously, or consecutively. Overall, table 5 and table 6 are in line with the previous findings. Interestingly, workers who combine employee earnings and income from self-employment also face a lower AROP compared to the self-employed in most countries.

When comparing strict employees with workers that combine income sources we find little difference in most countries. In some countries, combining income sources tends to be a particularly effective strategy to avoid poverty, like in Bulgaria, Czech Republic, Croatia, Hungary, Italy, Lithuania, and Portugal. Conversely, in Iceland, Norway, Poland and Sweden employees are better off from a poverty perspective than those combining income sources. For MD we find again that the differences between self-employed and employees are less pronounced and far less uniform across countries. In several countries employees face a higher MD rate, while in, Cyprus, Greece, and Romania the self-employed have higher MD rates compared to employees. Those combining income sources tend to be less likely to be materially deprived compared to strict employees. In some countries they are also less likely to be MD compared to the strictly self-employed.

Table 5. At-risk of poverty rate among workers, by income source during the reference period, individuals aged 18-64, 2014

	Only employee	Only self-employed	(a)	Combination	(b)	(c)
AT	6,3	13,6	***	6,4		**
BE	3,5	14,8	***	1,6		***
BG	9,2	16,8	**	2,7	***	***
CY	7,9	8,9		5,2		
CZ	2,9	7,1	***	0,7	**	***
DE	7,2	17,7	***	7,7		***
DK	4,0	15,4	*	4,0		*
EE	9,1	43,5	***	10,9		***
EL	8,6	22,9	***	5,2		***
ES	9,9	26,2	***	9,8		***
FI	2,5	14,3	***	3,0		***
FR	6,4	23,6	***	5,9		***
HR	4,8	14,5	***	2,1	**	***
HU	6,5	5,9		3,9	(*)	
IE	3,6	12,6	***	2,4		***
IS	3,7	19,1	**	7,2	(*)	*
IT	9,0	20,7	***	6,2	**	***
LT	8,2	14,7	*	2,1	***	***
LU	10,2	21,3	**	13,0		
LV	7,2	29,4	***	9,1		***
MT	4,6	13,6	***	7,0		*
NL	4,1	9,6	**	8,0		
NO	4,4	10,6	**	6,7	(*)	
PL	7,3	20,2	***	12,4	**	***
PT	7,8	18,5	***	4,2	*	***
RO	5,6	57,7	***	8,8		***
SE	5,7	27,9	***	10,6	**	***
SI	4,3	26,4	***	3,6		***
SK	4,2	8,5	**	-		
UK	6,0	16,9	***	7,7		**

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed; (b) employees and combination; and (c) self-employed and combination.

Source: EU-SILC 2014, own calculations.

Table 6. Material deprivation among workers, by income source during the reference period, individuals aged 18-64, 2014, 2014

	Employee	Self-employed	(a)	Combination	(b)	(c)
AT	6,4	4,2	(*)	2,5	***	
BE	6,4	3,0	**	1,0	***	
BG	33,1	26,7	*	22,9	***	
CY	30,7	43,4	***	30,8		**
CZ	12,0	7,3	***	8,8		
DE	7,3	4,8	*	5,2		
DK	4,4	1,0	***	3,0	*	
EE	10,5	13,3		9,6		
EL	28,1	34,6	**	20,7		**
ES	12,2	10,9		8,1	*	
FI	3,8	4,5		2,2	*	*
FR	8,8	9,4		8,7		
HR	25,9	21,0	(*)	20,7		
HU	34,6	13,3	***	13,9	***	
IE	13,7	9,5	*	2,1	***	**
IS	3,5	2,6		3,8		
IT	17,9	16,1		14,4	*	
LT	17,7	14,2		11,6	**	
LU	3,9	2,4		2,6		
LV	26,3	25,4		17,0	***	(*)
MT	14,2	10,2	*	11,7		
NL	5,7	4,9		4,4		
NO	2,2	1,3		1,0	(*)	
PL	16,7	15,0	*	15,7		
PT	19,6	16,1		8,3	***	*
RO	30,0	59,6	***	45,0	(*)	
SE	1,7	1,4		0,2	***	
SI	12,5	11,3		12,8		
SK	15,1	10,1	**	12,0		
UK	9,5	8,7		5,0	*	

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) employees and self-employed; (b) employees and combination; and (c) self-employed and combination.

Source: EU-SILC 2014, own calculations.

In sum, this first helicopter perspective leads to mixed conclusions as regard the socio-economic position of self-employed. Employees have a lower AROP compared to self-employed, whereas for MD the evidence is far from uniform and depends on the definition of self-employment adopted. In most countries, MD does not differ significantly by employment status. Consistent across all three approaches, the self-employed have lower MD rates in Austria, Belgium, Czech Republic, Croatia, Hungary, Ireland, and Slovakia. In other countries, Cyprus, Greece and Romania, the self-employed face particularly high MD rates, especially as self-employed workers without employees or unpaid family workers. In these countries, substantial shares of the working population live on subsistence agriculture (Frazer & Marlier, 2010). Overall, the results are

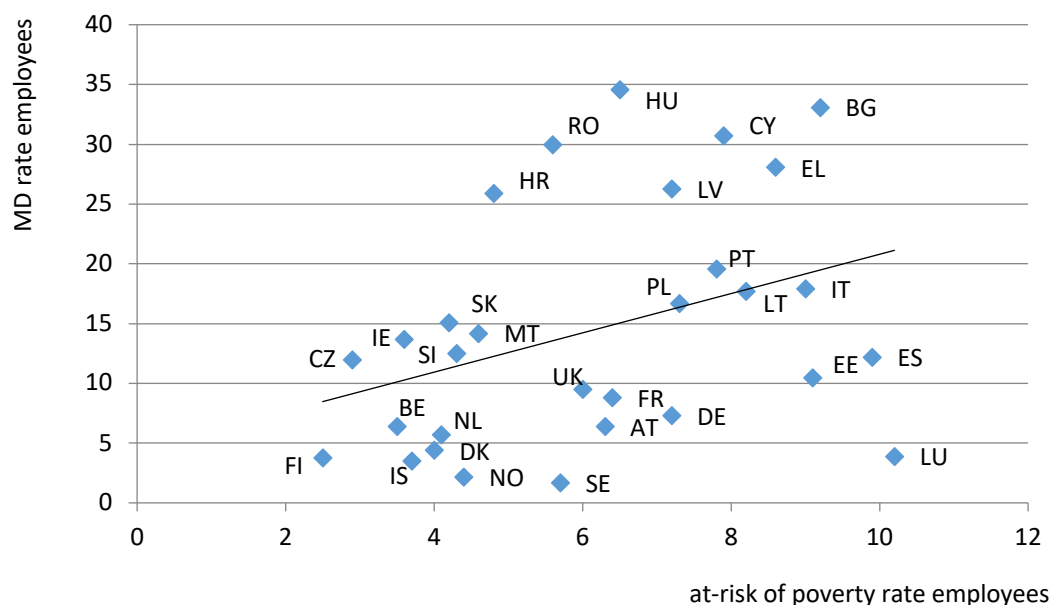
consistent with earlier evidence suggesting that while self-employed face an increased income poverty risk, they are not necessarily more likely to be MD (Sevä & Larsson, 2015).

Two additional remarks are in order. First, the figures above do not make a distinction between full-time and part-time employment. Appendix A1.2 and A.1.4 show that the part-time self-employed make out a relatively small segment of the total workforce across Europe. Yet, among the self-employed they do represent a substantial share. Appendix 2 further shows the AROP and MD rates of both employees and the self-employed by working time. While working part-time tends to be associated with higher AROP and MD rates among employees, this is not necessarily the case among self-employed. Second, note that the AROP and MD rates tell us little about the depth of poverty. The relative median AROP gap as well as the average number of items lacking may provide a more nuanced picture. The former is calculated as the difference between the median equivalised disposable income of people below the AROP threshold and AROP threshold, expressed as a percentage of the AROP threshold. In other words, a higher AROP gap indicates that income poverty is more extreme. From appendix 3 we see that, adopting the income based self-employment definition as used in tables 5 and 6, the depth of poverty is more problematic for the self-employed, with the exception of Cyprus and Iceland. Hence, not only do self-employed face a higher AROP, among the income poor the self-employment are typically at the lowest end of the income distribution. This picture also comes about when looking more closely at the overall earnings distribution. The self-employed are clearly concentrated at the bottom of the earnings distribution (appendix 5).

3.2.2 Connecting some dots: The overlap between AROP and MD

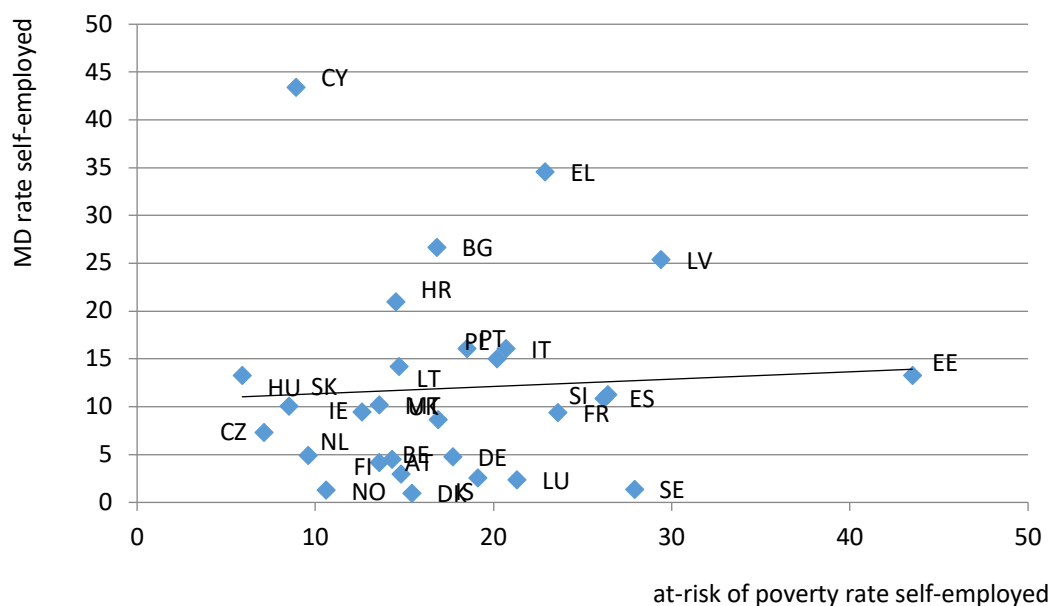
We now know that the share of poor self-employed as well as the relative position of the self-employed compared to employees differs by the poverty indicator that is used. We now turn to the overlap between AROP and MD among the self-employed. Marking workers' employment status by income source, we see that for employees a positive correlation at the country level exists between AROP and MD (figure 6). For the self-employed, however, no such relationship is found (figure 7). In other words, MD and AROP clearly measure something different among self-employed. For the 'hybrid' group combining employee and self-employment income no correlation was found either ($r=0.012$; figure not shown). When looking at the current employment situation to mark out the self-employed, the positive correlation only remains among employees (0.327). Figures 8 and 9 confirm that for self-employed, both with and without employees, no positive correlation between AROP and MD rates exist at the country level.

Figure 6. Correlation AROP and MD among employees (only income as employee), individuals aged 18-64, 2014 ($r=0.367$)



Source: EU-SILC 2014, own calculations.

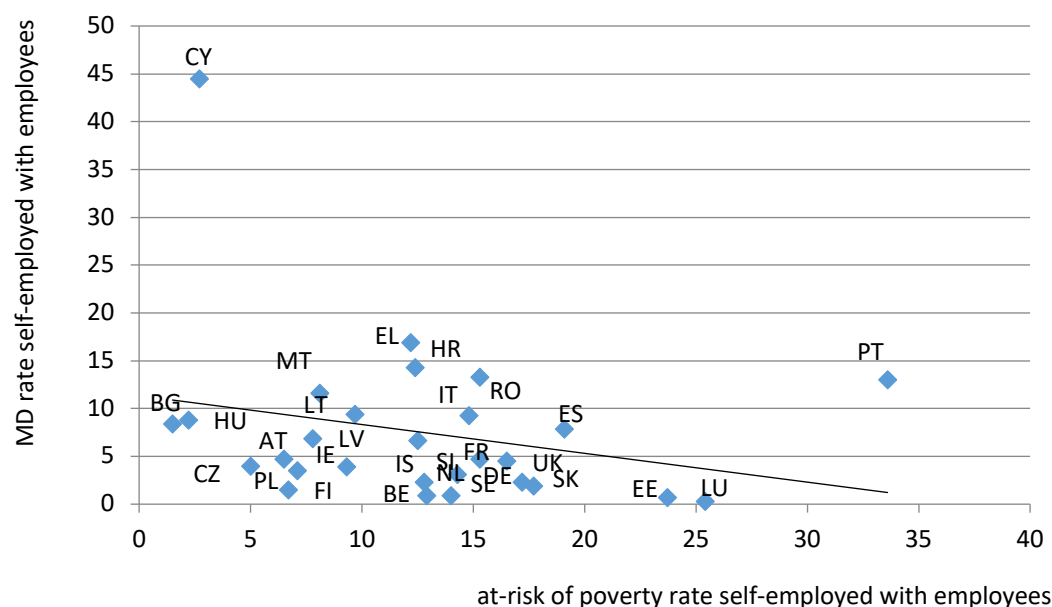
Figure 7. Correlation AROP and MD among the self-employed (only income from self-employment), individuals aged 18-64, 2014 ($r=0.060$)



Note: Romania is not included as an extreme case that influenced overall correlation level. Including it gives a correlation of $r=0.480$.

Source: EU-SILC 2014, own calculations.

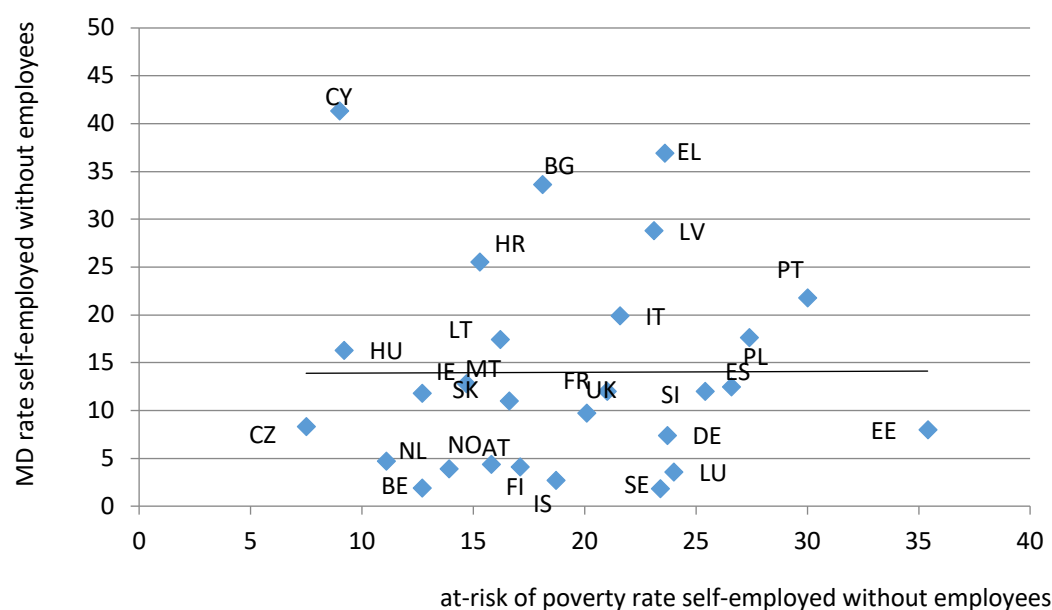
Figure 8. Correlation of AROP and MD among self-employment persons with employees, individuals aged 18-64, 2014 ($r=-0.254$)



Note: Excluding CY and PT, apparently influential points, does not alter the correlation ($r=-0.277$).

Source: EU-SILC 2014, own calculations.

Figure 9. Correlation of AROP and MD among self-employment persons without employees, individuals aged 18-64, 2014 ($r=-0.005$)



Note: Romania is not included as an extreme case that influenced overall correlation level. Including it gives a correlation of $r=0.456$.

Source: EU-SILC 2014, own calculations.

So far we have looked at how AROP and MD correlate at the country level. What is the overlap at the individual level? Looking at MD among workers who are AROP using micro-level data, we see that in most countries the overlap between both statuses is rather limited (table 7). Income poor employees are more likely to face MD compared to income poor self-employed. When looking at the same by self-reported current activity status, the overlap between AROP and MD is again especially low among self-employed

with employees. Overall, these findings are in line with country case studies claiming that income poverty is a worse predictor of living standards among the self-employed (Bradbury, 1997; Sevä & Larsson, 2015).

Table 7. Share of MD among workers AROP, individuals aged 18-64, Europe 2014

	Income based definition		Self-reported current activity status		
	Employee	Self-employed	Employee	Self-employed with employees	Self-employed without employees
AT	25.2	20.9	24.6	35.1	17.4
BE	40.7	9.4	39.9	0.0	12.8
BG	76.5	74.6	76.9	58.8	79.0
CY	56.9	76.7	58.6	77.0	79.0
CZ	43.1	16.5	42.5	0.0	20.0
DE	32.0	12.6	28.9	11.8	17.3
DK	30.2	0.0	26.2	(-)	(-)
EE	25.9	18.6	31.1	0.0	13.6
EL	80.4	67.4	80.4	44.6	71.5
ES	41.1	22.6	41.5	16.0	24.9
FI	12.3	10.7	10.1	8.8	13.4
FR	37.4	16.1	37.7	0.0	23.4
HR	66.7	32.3	66.0	17.0	39.2
HU	79.6	49.8	79.5	18.8	48.9
IE	31.1	23.6	31.3	18.3	29.5
IS	13.3	3.6	15.2	34.0	4.8
IT	51.1	36.9	50.6	23.8	41.8
LT	43.2	31.7	43.7	6.4	45.2
LU	12.6	4.4	12.9	3.1	8.1
LV	53.8	41.6	54.4	16.1	38.6
MT	39.1	16.5	38.8	14.9	18.9
NL	37.8	11.9	38.6	11.9	12.9
NO	13.9	3.4	10.9	(-)	9.3
PL	45.4	30.4	46.9	8.7	34.0
PT	51.6	35.6	51.2	29.4	33.7
RO	60.0	72.3	55.4	35.5	71.7
SE	9.1	4.9	9.3	6.1	6.8
SI	37.4	20.1	35.4	9.6	23.2
SK	45.2	10.9	44.6	0.0	15.5
UK	29.2	14.8	28.8	6.9	13.8

Source: EU-SILC 2014, own calculations.

4 The profile of the self-employed: An explanation for their higher poverty risk?

We now turn to the socio-demographic and socio-economic profile of the self-employed. Tables 8 and 9 give an overview of the profile of the self-employed, broken down by the income approach and by the self-declared current status. Profile characteristics may provide a first indication of why self-employed in general, and own-account self-employed in particular, face an increased poverty risk. Yet, as AROP and MD is typically predicted by similar individual and socio-demographic characteristics, the specific profile of self-employed probably explains little as to why self-employed face high AROP, but not a higher MD. However, income poverty is typically more strongly related to characteristics that pick up current income volatility more strongly.

The self-employed are on average lower skilled compared to employees, while people combining employee and self-employment earnings and self-employed with employees are more often high skilled (table 8). As skill-level predicts earnings capacity, it may explain why self-employed face an increased poverty risk. Low education is also a predictor of a higher risk of material deprivation (Fusco et al., 2011). Hence, a relative overrepresentation of the low skilled among the self-employed will, *ceteris paribus*, result in higher comparative MD rates as well. Yet this is at odds with the stylised facts presented above. However, a cohort effect may contribute to a better understanding of the puzzle. Self-employed are typically older and elderly tend to be less skilled on average. At the same time, older people tend to have more assets, reducing their exposure to MD.

In general, women have a weaker labour market attachment and hold less rewarding positions. However, their in-work AROP rates tend to be lower as their additional income often helps to lift the overall household income package above the poverty line (Peña-Casas & Ghailani, 2011). Because the self-employed are more likely to be men, their increased poverty risk can be associated with role specialisation, resulting in lower overall household income compared to dual earner households. As self-employed spend much time in their business and work more hours, less opportunities exist for their partner to engage in the labour market when caring responsibilities are demanding. Hence, the gendered nature of self-employment in combination with other family characteristics may contribute to their increased poverty risk. The gendered nature of work may thus help to explain why self-employment is not necessarily problematic from a material deprivation perspective as well. Precisely because men can specialise and create successful business that employ other people, their overall wealth accumulation, partially through their business, may lead to a higher living standard and at the same time less incentives for spouses to work. The latter then explains the increased AROP rate because overall household work-intensity is lower. This is in effect the picture that arises from tables 8 and 9.

Households with dependent children tend to be more exposed to poverty because needs are higher, other things equal. Yet the presence of children differs little between employees and the self-employed across Europe. If anything, the self-employed tend to have more children. On the other hand, the self-employed are less often single adult families.

Among the self-employed, those without employees tend to have a lower work-intensity compared to self-employed with employees. Self-employed with employees tend to have a higher work-intensity, are less likely to have low earnings as they typically hold in managerial or professional occupations, and they live in a household with a higher work-intensity. In other words, self-employed with employees show profile characteristics that are particularly favourable to be better protected against AROP and MD.

In sum, what we learn from this section is that individual as well as household characteristics provide a first explanation of why the self-employed face increased poverty risks across Europe. While some noteworthy differences exist across countries in the profile characteristics (see appendix 4), the basic picture drawn in this section holds in most countries. The share of low earners among the self-employed is especially striking. But they also tend to live in households with lower work intensity, especially with non-working partners, if there is any. This may explain why self-employed are more likely to be AROP. However, it does not explain the discrepancy between AROP and MD poverty measurement. A partial explanation for this discrepancy may lie in the fact that the self-employed tend to be older, and that they can draw on other assets than income. In the next section we look further at which in-work poverty mechanisms are relevant for self-employed across Europe.

Table 8. Profile characteristics by employment status (income definition), Europe 2014

	employee	self-employed	combination
men	51.8	67.6	61.2
women	48.2	32.4	38.8
Low skilled	15.7	25.4	12.9
Middle skilled	45.4	43.8	40.0
High skilled	38.9	30.8	47.1
[18-29]	17.5	9.0	12.1
[30-49]	54.8	55.2	55.9
[50-64]	27.6	35.9	32.0
no children	49.9	48.0	47.8
1 child	24.0	22.8	22.0
2 children	20.4	21.6	22.3
> 2 children	5.7	7.6	8.0
single	16.9	14.9	18.1
couple	56.1	53.1	56.8
other	27.0	32.0	25.1
HH_WI =]0,0,5]	9.4	10.6	8.1
HH_WI =]0,5, 0,8]	21.6	23.3	21.3
HH_WI =]0,8, 1[16.0	14.5	17.2
HH_WI = 1	53.0	51.6	53.4
not low earnings	81.0	58.7	85.0
low earnings	19.0	41.3	15.0
ISCO 1 & 2	26.3	27.0	39.3
ISCO 3	17.7	10.2	15.6
ISCO 4	11.6	1.7	6.7
ISCO 5	15.8	15.7	12.2
ISCO 6, 7 & 8	19.9	40.3	21.1
ISCO 9 (& 0)	8.7	5.1	5.3
WI others in HH average (std)	0.64 (0.42)	0.62 (0.42)	0.63 (0.42)
own WI average (std)	0.93 (0.17)	0.94 (0.16)	0.94 (0.14)

Note : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces.

Source: EU-SILC 2014, own calculations.

Table 9. Profile characteristics by employment status (income definition), Europe 2014

	Self-employed with employees	Self-employed without employees
men	73.8	65.4
women	26.2	34.6
Low skilled	17.8	25.4
Middle skilled	40.8	44.6
High skilled	41.4	30.0
[18-29]	5.4	9.9
[30-49]	56.3	54.9
[50-64]	38.2	35.2
no children	46.2	48.3
1 child	23.6	22.5
2 children	22.9	21.4
> 2 children	7.3	7.7
single	13.4	15.6
couple	62.1	51.6
other	24.5	32.8
HH_WI =]0,0,5]	8.3	11.4
HH_WI =]0,5, 0,8]	20.1	24.3
HH_WI =]0,8, 1[13.0	14.5
HH_WI = 1	58.7	49.9
not low earnings	80.6	56.5
low earnings	19.4	43.5
ISCO 1 & 2	48.5	23.5
ISCO 3	9.0	11.2
ISCO 4	1.6	1.7
ISCO 5	15.1	15.3
ISCO 6, 7 & 8	24.7	42.5
ISCO 9 (& 0)	1.1	5.8
WI others in HH average (std)	0.65 (0.41)	0.61 (0.42)
own WI average (std)	0.97 (0.10)	0.93 (0.17)

Note: DK and NO are not included in the analysis because of missing values.

Note: ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Source: EU-SILC 2014, own calculations.

5 The relevance of in-work poverty mechanisms for the self-employed

In the previous section, we looked at the profile of the self-employed and examined whether their socio-demographic and job characteristics can explain their higher poverty risks. In this section we look at the other side of the coin. Some profile characteristics can indeed be associated with an increased poverty risk, but at the same time, in-work poverty mechanisms can be more or less important for self-employed, or work differently. Table 10 shows the log odds for AROP and MD among workers aged 18-64, with self-employment defined on the basis the income situation during the income reference period. For this analysis we do not look at the special group of workers combining income from self-employment and as employee. Table 12 also shows models predicting AROP and MD, for self-employed based on self-declared current activity status and this in order to distinguish between self-employed with and without employees. Subsequently, we added interaction effects for the various covariates separately to these models (tables 11 and 13), indicating whether particular characteristics play a more important role in explaining the poverty risk of the self-employed, and in particular the poverty risk of the solo self-employed.

Models AROP_1 and MD_1 in table 10 show the effect of various known individual and household level characteristics on the poverty risk of workers. We see that the self-employed have a log odds of being poor that is significantly higher, a log odds of 1,07. In other words, the predicted probabilities to be at-risk of poverty for employees and self-employed is on average 7.3 and 14.6 percent in Europe, controlling for other factors. For material deprivation this is respectively 13.0 and 11.3 percent (log odds of -0,10). Thus, even after controlling for other known in-work poverty drivers, the picture remains that self-employed face an increased income poverty risk, while at the same time deprivation is lower. The other variables follow known patterns (Andress & Lohmann, 2008; Crettaz, 2013; Fraser et al., 2011; Lohmann, 2009). Low skilled, youngsters, workers with children, low individual work-intensity, low work-intensity of other household members, low earnings, as well as working in elementary occupations are associated with both a higher income poverty risk and a higher material deprivation risk. Note that women are less likely to be at-risk of income poverty, while for MD gender matters little. This can be explained by the gender paradox inherent to the measurement of in-work poverty (Peña-Casas & Ghailani, 2011).

Table 10. Logistic regression models (log odds) predicting in-work at-risk of poverty (AROP) and in-work material deprivation (MD), income definition of self-employed (n= 197 163).

		Model AROP_1		Model MD_1	
employment status (ref.: employee)	self-employed	1.07	***	-0.10	***
sex (ref.: male)	female	-0.52	***	0.02	
age (ref: [18-29])	[30-49]	-0.27	***	-0.20	***
	[50-64]	-0.40	***	-0.44	***
education (ref.: low)	middle	-0.34	***	-0.45	***
	high	-0.54	***	-0.86	***
children (ref.: 0)	1	0.72	***	0.32	***
	2	1.14	***	0.40	***
	>2	1.90	***	0.86	***
famtype (ref.: single)	couple	0.24	***	-0.28	***
	other	-0.25	***	-0.08	(*)
own WI		-0.31	***	-0.71	***
other WI		-2.54	***	-1.18	***
low earnings (ref.: no)	yes	1.97	***	0.54	***
occupation (ref.: ISCO 1 & 2)	ISCO 3	0.00		0.51	***
	ISCO 4	0.30	***	0.67	***
	ISCO 5	0.63	***	1.08	***
	ISCO 6, 7 & 8	0.75	***	1.14	***
	ISCO 9 (& 0)	1.02	***	1.48	***
cst		-1.48	***	-1.90	***

Note : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Note: All models also include country dummies.

Source: EU-SILC 2014, own calculations.

Turning to the interaction effects in table 11, we see that while women are less likely to be at risk-of poverty when working, this is even less so for the self-employed. When working as self-employed, women are probably more often secondary earners, lifting the household above the poverty line. Elderly are typically better protected against in-work AROP, yet for the self-employed age matters less. Note that we do not find that for the self-employed age is less relevant as a predictor of MD as well. Sectoral differences contribute to the income poverty risk of workers, however, they tend to be less relevant for the self-employed. Interestingly, own work-intensity is also less relevant as an in-work poverty mechanism for the self-employed and the work-intensity of other household members provides less of a protection. On the other hand, own earnings are especially relevant for understanding in-work poverty among self-employed. These findings are consistent with the MD indicator for measuring poverty.

Table 11. Base and interaction effects of logistic regression models (log odds) predicting in-work at-risk of poverty (AROP) and in-work material deprivation (MD), income definition of self-employed.

		Models AROP_2a-i		Models MD_2a-i	
employment (ref.: employee)	self-employed	1.12	***	-0.16	**
sex (ref.: male)	female	-0.49	***	0.04	
	self-employed female	-0.14	(*)	-0.12	(*)
employment (ref.: employee)	self-employed	0.83	***	-0.22	(*)
age (ref: [18-29])	[30-49]	-0.31	***	-0.21	***
	[50-64]	-0.45	***	-0.43	***
	self-employed [30-49]	0.26		0.05	
	self-employed [50-64]	0.29	(*)	-0.03	
employment (ref.: employee)	self-employed	1.07	***	-0.13	(*)
education (ref.: low)	middle	-0.33	***	-0.43	***
	high	-0.56	***	-0.85	***
	self-employed middle	-0.04		-0.16	(*)
	self-employed high	0.07		0.02	
employment (ref.: employee)	self-employed	1.17	***	-0.19	**
Children (ref.: 0)	1	0.75	***	0.32	***
	2	1.18	***	0.39	***
	>2	2.00	***	0.88	***
	self-employed 1	-0.08		-0.02	
	self-employed 2	-0.16		0.02	
	self-employed >2	-0.49	**	-0.15	
employment (ref.: employee)	self-employed	1.05	***	-0.33	**
famtype (ref.: single)	couple	0.23	***	-0.30	***
	other	-0.26	***	-0.09	(*)
	self-employed couple	0.02		0.18	
	self-employed other	0.05		0.14	
employment (ref.: employee)	self-employed	-0.11		-0.60	*

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own WI		-1.51	***	-0.75	***
	self-employed * own WI	1.29	***	0.42	(*)
employment (ref.: employee)	self-employed	0.85	***	-0.36	***
other WI		-2.66	***	-1.22	***
	self-employed * other WI	0.49	***	0.30	**
employment (ref.: employee)	self-employed	0.79	***	-0.33	***
low earnings (ref.: no)	yes	1.85	***	0.49	***
	self-employed * low paid	0.47	***	0.26	**
employment (ref.: employee)	self-employed	1.48	***	0.16	
occupation (ref.: ISCO 1 & 2)	ISCO 3	0.13		0.57	***
	ISCO 4	0.46	***	0.73	***
	ISCO 5	0.85	***	1.14	***
	ISCO 6, 7, & 8	0.90	***	1.22	***
	ISCO 9 (& 0)	1.22	***	1.53	***
	self-employed ISCO 3	-0.29	(*)	-0.39	*
	self-employed ISCO 4	-0.57		-0.67	(*)
	self-employed ISCO 5	-0.73	***	-0.40	**
	self-employed ISCO 6,7, & 8	-0.38	**	-0.45	***
	self-employed ISCO 9 (& 0)	-0.79	**	-0.23	

Note 1 : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Note 2: Underlying model is the same as table xx, interaction effects added separately to the model.

Source: EU-SILC 2014, own calculations.

Table 12. Logistic regression models (log odds) predicting in-work at-risk of poverty (AROP) and in-work material deprivation (MD) among self-employed based on current activity status (n= 26 657).

		Model AROP_SE1		Model MD_SE1	
self-employed (ref.: with employees)	without employees	0.15	**	0.54	***
sex (ref.: male)	female	-0.61	***	-0.22	***
age (ref: [18-29])	[30-49]	0.06		-0.24	**
	[50-64]	0.05		-0.40	***
education (ref.: low)	middle	-0.45	***	-0.47	***
	high	-0.72	***	-0.96	***
children (ref.: 0)	1	0.79	***	0.24	***
	2	1.07	***	0.35	***
	>2	1.58	***	0.73	***
famtype (ref.: single)	couple	-0.12	(*)	-0.24	**
	other	-0.68	***	-0.14	(*)
own WI		-0.85	***	-1.09	***
other WI		-1.94	***	-0.87	***
low earnings (ref.: no)	yes	2.19	***	0.75	***
occupation (ref.: ISCO 1 & 2)	ISCO 3	-0.02		0.14	
	ISCO 4	-0.24		0.02	
	ISCO 5	0.38	***	0.60	***
	ISCO 6, 7 & 8	0.44	***	0.47	***
	ISCO 9 (& 0)	0.52	***	1.08	***
cst		-1.27	***	-2.09	***

Note : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Note: All models also include country dummies. DK and NO are not included in the analysis because of missing values.

Source: EU-SILC 2014, own calculations.

Models AROP_SE1 and MD_SE1 in table 12 show the effect of various known individual and household level characteristics on the poverty risk of self-employed workers with and without employees. We see that the self-employed without employees have a log odds of being poor that is significantly higher, a log odds of 0.15, corresponding with a 1.4 percentage point difference, whereas without controls the difference was 8.2 percentage points (results not shown). Hence, the various covariates explain a large part of the poverty difference between the self-employed with and without employees. After controlling for various known drivers of in-work poverty, we find a predicted AROP of 16.2 and 17.6 percent for self-employed with and without employees. For material deprivation this is respectively 10.5 and 15.3 percent (log odds of 0.54). Among self-employed, we see that, as indicated above, age matters little to predict the AROP, while it does matter for MD. Older self-employed people are less likely to face material deprivation. Other characteristics follow again the known patterns.

Turning to the interaction effects in table 13, we find that some of the basic mechanisms leading to an increased poverty risk among self-employed differ little between those with and those without employees. Compared to being single, living in a couple or 'other' household type tends to protect the self-employed without employees, but appears less relevant for those with employees. The on average lower earnings of

self-employed without employees yield other potential household income more relevant. However, neither own work-intensity nor the work-intensity of other household members affects the income poverty risk of the self-employed with and without employees differently. Low earnings, on the other hand, are especially relevant as an income poverty mechanism for the self-employed with employees. However, for MD the effect of the level of earnings is rather similar between both groups of self-employed. Conversely, for MD own work intensity is a more relevant mechanism for self-employed persons with employees. While the elderly are usually better protected against income poverty, for self-employed without employees we do not find this age-related effect. Hence, not only is the income of elderly solo self-employed perhaps more volatile, when not being able to employ workers themselves, older self-employed have probably accumulated less wealth over their life course. For MD, we see that a higher education is associated with a lower MD among self-employed. This relationship is stronger for self-employed with employees. In other words, for the self-employed without employees education level matters less.

In sum, in this section we showed that even after controlling for other characteristics, (solo) self-employed people still face a higher poverty risk. MD also remains lower for the self-employed compared to employees. We find that low earnings are especially relevant for understanding in-work poverty among self-employed. Furthermore, among the self-employed the level of earnings tends to be especially relevant for self-employed with employees. Note, that while in a previous section we highlighted the differences in AROP rate and MD rates among self-employed and the limited overlap between both, we see that similar factors contributing to both income poverty and material deprivation among the self-employed. In the next section we zoom in on this overlap.

Table 13. Base and interaction effects of logistic regression models (log odds) predicting in-work at-risk of poverty (AROP) and in-work material deprivation (MD) among self-employed based on current activity status

		Models		Models	
		AROP_SE2a-i		MD_SE2a-i	
SE (ref.: with employees)	without employees	0,23	***	0,58	***
sex (ref.: male)	female	-0,34	**	-0,08	
	without employees female	-0,33	**	-0,15	
SE (ref.: with employees)	without employees	-0,33		0,18	
age (ref: [18-29])	[30-49]	-0,36	(*)	-0,54	*
	[50-64]	-0,43	*	-0,81	***
	without employees [30-49]	0,48	*	0,34	
	without employees [50-64]	0,56	*	0,47	*
SE (ref.: with employees)	without employees	0,20	(*)	0,37	***
education (ref.: low)	middle	-0,39	**	-0,66	***
	high	-0,68	***	-1,26	***
	without employees middle	-0,07		0,21	(*)
	without employees high	-0,05		0,36	*
SE (ref.: with employees)	without employees	0,12		0,56	***
Children (ref.: 0)	1	0,64	***	0,21	
	2	1,09	***	0,35	*
	>2	1,59	***	0,89	***
	without employees 1	0,17		0,04	
	without employees 2	-0,02		0,00	
	without employees >2	-0,01		-0,20	
SE (ref.: with employees)	without employees	0,45	**	0,76	***
famtype (ref.: single)	couple	0,21		-0,08	
	other	-0,47	**	0,16	
	without employees couple	-0,40	**	-0,18	
	without employees other	-0,26		-0,34	(*)
SE (ref.: with employees)	without employees	-0,41		-0,41	
own WI		-1,38	***	-2,00	***
	without employees * own WI	0,58		1,00	*
SE (ref.: with employees)	without employees	0,17	*	0,56	***

... continued

		Models		Models	
		AROP_SE2a-i		MD_SE2a-i	
other WI		-1,91	***	-0,85	***
	without employees * other WI	-0,04		-0,03	
SE (ref.: with employees)	without employees	0,50	***	0,55	***
low earnings (ref.: no)	yes	2,71	***	0,76	***
	without employees * low paid	-0,65	***	-0,01	
SE (ref.: with employees)	without employees	0,17	(*)	0,67	***
occupation (ref.: ISCO 1 & 2)	ISCO 3	0,02		0,26	
	ISCO 4	-0,06		0,07	
	ISCO 5	0,36	**	0,73	***
	ISCO 6, 7, & 8	0,45	***	0,61	***
	ISCO 9 (& 0)	0,80	*	1,16	**
	without employees ISCO 3	-0,05		-0,17	
	without employees ISCO 4	-0,22		-0,09	
	without employees ISCO 5	0,02		-0,18	
	without employees ISCO 6,7, & 8	-0,02		-0,19	
	without employees ISCO 9 (& 0)	-0,31		-0,13	

Note 1 : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Note 2: Underlying model is the same as table xx, interaction effects added separately to the model.

Source: EU-SILC 2014, own calculations.

6 Mapping route 3: From AROP to MD

Finally, in this section we examine the overlap between AROP and MD more in detail. One way of looking at the overlap between AROP and MD is to look at AROP as a predictor of MD. As income data may represent a poor indicator of actual living standards among the self-employed (Bradbury, 1997; Sevä & Larsson, 2015), we expect AROP to be a worse predictor for MD among the self-employed.

Basically, we find that for people in poverty the share of deprived persons is 26.2 percentage point higher, compared to those not in poverty (results not shown). On average across Europe, MD is 39.9 percentage points higher among the income poor as compared to the non-poor as far as employees are concerned, whereas for the self-employed MD is only 19.2 percentage points higher. In other words, the AROP and MD indicators relate more strongly among employees than among the self-employed. We did not find any significant difference between self-employed with and without employees regarding the overlap between AROP and MD (results not shown).

Table 14 shows that the particular profile of self-employed explains, at least partially, why AROP is less likely to result in MD among self-employed. Low earnings, for example, are associated with both a higher AROP and higher MD. Yet, the relationship is stronger between low earnings and AROP among the self-employed (see also table 13). As self-employed are more often low earners, controlling for it reduces the interaction effect between self-employment and AROP on MD. Hence, profile characteristics of the self-employed explain to some extent why income is not a good predictor of the living standard of self-employed. The profile characteristics make self-employed especially likely to face AROP, while these factors do matter for understanding MD, but to a smaller degree. There is still a lot of potential explanatory power in unobserved elements, like asset accumulation and income volatility.

Table 14. Logistic regression models (log odds) predicting in-work material deprivation (MD) among self-employed based on current activity status

		Model MD_2a		Model MD_2b	
employment status (ref.: employee)	self-employed	-0,20	***	-0,30	***
at-risk of poverty (ref.: no)	yes	1,91	***	0,97	***
interaction AROP self-employed		-0,41	***	-0,13	
sex (ref.: male)	female			0,07	**
age (ref: [18-29])	[30-49]			-0,18	***
	[50-64]			-0,41	***
education (ref.: low)	middle			-0,42	***
	high			0,81	***
children (ref.: 0)	1			0,26	***
	2			0,29	***
	>2			0,67	***
famtype (ref.: single)	couple			0,32	***
	other			-0,06	
other WI				-0,95	***
own WI				-0,55	***
low earnings (ref.: no)	yes			0,34	***
occupation (ref.: ISCO 1 & 2)	ISCO 3			0,51	***
	ISCO 4			0,66	***
	ISCO 5			1,05	***
	ISCO 6, 7 & 8			1,10	***
	ISCO 9 (& 0)			1,41	***
cst		-2,96	***	-2,19	***

Note : ISCO : 1 & 2: Managers & Professionals, 3: Technicians and Associate Professionals, 4: Clerical Support Workers, 5: Services and Sales Workers, 6, 7 & 8: Skilled Agricultural, Forestry and Fishery, Craft and Related Trades, & Plant and Machine Operators and Assemblers, 9 (& 0): Elementary Occupations & Armed Forces .

Note: All models also include country dummies.

Source: EU-SILC 2014, own calculations.

7 Conclusion

This first exploration demonstrates that the socio-economic position of the self-employed warrants greater scrutiny. Worries about the rise of self-employment, especially own-account work appear to some extent founded - we do find significant levels of in-work poverty in virtually every country included in this study, especially among sole own-account workers. Yet if there one thing that emerging from the analysis then it is that the self-employed are a very mixed group, with lots of within-group inequality. There is, as far as the data goes, much more inequality among self-employed workers than among employees. The consequence of that is that it may be difficult to implement policies that fit the group as a whole. And since there is so much inequality there may also be limits to the levels of solidarity that can be mustered within the group. Clearly, the need for redistributive policies appears to vary quite significantly among the self-employed.

The findings presented here do little to dispel perceptions that reported incomes of the self-employed generally offer poor guidance to their material living standards and to their actual levels of need when they are observed as living in income poverty. We find very significant discrepancies between income-based poverty measures and measures that capture actual living standards. This is true across countries. As we have indicated, there may be legitimate reasons for this. The self-employed can often draw on assets accumulated over the life cycle or on business assets that they control. But of course this will not always be the case and it is this segment that we should be worried about. Clearly, further work is to be done here. We need to look more in depth at what distinguishes the 'truly' deprived from the less truly needy. This not just a matter of gathering and crushing more data for academic purposes. Perhaps the bigger challenge is to establish practical and feasible ways of establishing 'real' levels of need for purposes of redistribution and public action.

We also need to learn more about the underlying causes of need among the unsuccessful self-employed. To what extent is this driven by push factors, for example businesses effectively pushing people into self-employment who have neither the capacity to operate as such nor the desire? To what extent are lacking alternatives in the regular labour market a driver? For example for immigrants unable to secure jobs, especially at their skills levels. And to what extent are other forces at work, for example local businesses being unable to compete with international businesses? These and many other questions remain to be answered.

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8 Appendix

8.1 Appendix 1: Composition of the labour force by definition of self-employment

Table A1.1. Composition of the workforce by current employment status (1), individuals aged 18-64

	Employee	Self-employed with employee	Self-employed without employee	family worker	n-value
AT	88.2	4.0	7.5	0.4	5553
BE	89.4	3.1	7.0	0.6	5233
BG	90.4	3.4	5.7	0.6	4400
CY	89.0	2.7	8.0	0.3	4413
CZ	82.7	3.6	13.4	0.4	7495
DE	93.6	2.5	3.8	0.1	11160
DK	92.1	0.0	0.1	7.9	5996
EE	91.0	3.7	5.1	0.1	6054
EL	65.9	6.0	25.5	2.6	5895
ES	82.8	5.2	11.8	0.2	10306
FI	86.1	4.0	9.9	0.1	11418
FR	90.2	0.7	8.9	0.3	10040
HR	90.0	4.6	5.1	0.3	4120
HU	88.9	3.4	7.2	0.5	8452
IE	85.6	4.2	9.3	0.9	4569
IS	89.5	3.3	7.1	0.1	4345
IT	76.8	5.3	16.2	1.7	16843
LT	89.9	2.4	6.1	1.6	4624
LU	93.1	2.5	4.1	0.2	4280
LV	91.1	3.1	5.5	0.4	5265
MT	88.8	3.3	7.7	0.1	4333
NL	86.2	3.5	9.9	0.4	11269
NO	92.8	0.0	7.0	0.1	8257
PL	80.0	3.6	14.3	2.2	12679
PT	87.7	3.4	8.5	0.4	6067
RO	73.6	1.1	20.1	5.2	6807
SE	90.6	3.8	5.6	0.0	6130
SI	90.2	2.2	7.2	0.3	10765
SK	84.5	2.8	12.6	0.0	6575
UK	88.1	2.1	9.8	0.0	9220

Source: EU-SILC 2014, own calculations.

Table A1.2. Composition of the workforce by current employment status (2), individuals aged 18-64

	FT employee	PT employee	FT self-employed	PT self-employed	n-value
AT	66.5	21.3	10.4	1.8	5183
BE	65.0	24.1	10.0	0.9	4995
BG	88.0	2.2	9.3	0.5	4149
CY	82.1	6.9	6.8	4.2	4082
CZ	80.5	1.9	16.9	0.7	7238
DE	68.9	24.9	4.6	1.6	10645
DK	73.1	18.7	7.4	0.9	5720
EE	85.0	5.8	7.9	1.3	5753
EL	59.4	5.7	32.5	2.5	5528
ES	70.3	12.5	16.5	0.7	9560
FI	79.0	6.9	13.2	0.9	10820
FR	74.7	15.2	8.9	1.2	9735
HR	87.9	1.9	9.5	0.7	3837
HU	85.3	3.2	10.8	0.6	8070
IE	63.8	22.4	11.2	2.7	4370
IS	78.4	10.7	9.6	1.3	3730
IT	66.1	12.1	20.0	1.9	15888
LT	85.3	4.3	8.5	1.9	4445
LU	75.1	17.8	5.5	1.6	4084
LV	87.6	4.3	7.0	1.1	4820
MT	82.0	6.9	10.4	0.7	4,208
NL	49.4	36.6	10.1	3.9	10489
NO	81.8	11.0	6.4	0.8	8250
PL	74.8	4.8	18.3	2.1	12096
PT	83.1	4.3	11.1	1.5	5775
RO	73.6	0.3	16.3	9.9	6701
SE	72.6	17.8	8.4	1.1	5907
SI	86.7	3.5	9.1	0.8	10166
SK	82.0	2.7	14.5	0.8	6337
UK	70.2	18.6	8.5	2.7	8858

Source: EU-SILC 2014, own calculations.

Table A1.3. Composition of the workforce by self-declared main employment status during income reference period, individuals aged 18-64, 2014

	only employee	only self-employed	combination	n-value
AT	88.0	11.4	0.6	5560
BE	88.7	10.9	0.4	5380
BG	89.2	10.6	0.2	4475
CY	88.6	10.0	1.4	4413
CZ	82.4	17.2	0.5	7495
DE	91.9	7.7	0.4	11327
DK	90.4	9.0	0.7	6143
EE	89.6	9.7	0.8	6130
EL	65.0	34.5	0.5	5988
ES	81.9	17.6	0.6	10462
FI	85.0	13.0	2.0	11423
FR	86.5	13.4	0.2	10367
HR	90.0	9.8	0.2	4120
HU	89.0	10.7	0.3	8452
IE	86.4	13.2	0.4	4588
IS	89.1	9.4	1.5	4508
IT	77.9	21.8	0.3	16922
LT	88.7	10.5	0.8	4665
LU	93.3	6.4	0.3	4284
LV	87.7	11.7	0.6	5491
MT	88.3	10.9	0.8	4335
NL	86.0	11.9	2.1	11369
NO	92.8	6.9	0.4	8778
PL	67.7	31.0	1.3	14560
PT	87.4	12.1	0.6	6067
RO	73.6	26.2	0.3	6841
SE	89.2	10.3	0.5	6261
SI	88.3	10.1	1.6	10837
SK	84.3	15.3	0.4	6576
UK	88.0	11.2	0.7	9239

Source: EU-SILC 2014, own calculations.

Table A1.4. Composition of the workforce by self-declared main employment status (2) during income reference period, individuals aged 18-64, 2014

	FT employee	PT employee	FT self-employed	PT self-employed	combination	n-value
AT	67.4	18.8	9.9	1.4	2.6	5560
BE	65.2	21.2	9.2	1.0	3.4	5380
BG	86.0	2.8	8.2	0.7	2.3	4475
CY	80.4	5.6	6.3	3.0	4.7	4413
CZ	80.3	1.8	16.5	0.6	0.8	7495
DE	66.9	24.1	4.9	1.2	2.8	11327
DK	81.7	7.0	7.4	0.7	3.2	6143
EE	82.9	5.3	7.0	1.3	3.6	6130
EL	56.4	8.4	28.0	5.0	2.4	5988
ES	67.3	13.2	15.4	0.9	3.3	10462
FI	75.8	5.6	11.4	0.7	6.5	11423
FR	70.5	14.9	10.1	1.3	3.3	10367
HR	87.9	1.9	9.0	0.7	0.5	4120
HU	85.0	3.4	9.8	0.9	0.9	8452
IE	63.5	21.9	11.0	2.1	1.5	4588
IS	68.8	12.4	5.7	0.9	12.2	4508
IT	64.6	12.3	19.2	2.3	1.5	16922
LT	83.6	3.9	7.7	1.7	3.2	4665
LU	74.9	15.8	4.8	1.2	3.3	4284
LV	83.0	4.3	6.2	1.1	5.4	5491
MT	79.8	6.8	10.1	0.8	2.5	4335
NL	44.4	35.5	6.6	4.9	8.6	11369
NO	77.0	13.8	4.2	0.4	4.6	8778
PL	63.4	3.7	14.9	1.6	16.4	14560
PT	82.5	4.4	10.4	1.6	1.1	6067
RO	73.2	0.3	14.7	9.6	2.2	6841
SE	69.5	16.3	7.6	1.0	5.6	6261
SI	85.2	1.7	9.7	0.3	3.1	10837
SK	81.8	2.2	14.7	0.7	0.6	6576
UK	68.9	18.2	8.2	2.9	1.9	9239

Source: EU-SILC 2014, own calculations.

Table A1.5. Composition of the workforce by income source during income reference period, individuals aged 18-64, 2014

	only employee	only self-employed	combination	n-value
AT	83,2	8,7	8,1	5518
BE	88,6	9,3	2,1	5292
BG	83,2	6,4	10,4	4387
CY	84,8	9,4	5,9	4398
CZ	80,8	16,6	2,6	7444
DE	91,8	5,5	2,7	10883
DK	68,5	3,9	27,6	5718
EE	92,6	1,5	6,0	5818
EL	65,0	33,0	2,0	5893
ES	84,4	10,7	4,9	10252
FI	85,5	6,0	8,5	11292
FR	88,5	5,9	5,6	10095
HR	84,0	10,0	6,0	4092
HU	85,2	9,8	5,0	8439
IE	85,7	13,1	1,3	4505
IS	89,3	2,5	8,3	4458
IT	72,1	19,7	8,2	16888
LT	86,1	5,7	8,2	4548
LU	93,8	3,9	2,3	4251
LV	92,0	3,0	5,0	5220
MT	86,4	9,3	4,3	4313
NL	83,7	10,0	6,3	11136
NO	89,8	3,0	7,2	8460
PL	82,4	12,2	5,4	12998
PT	89,2	7,2	3,7	5712
RO	75,2	24,1	0,7	6578
SE	88,8	2,3	8,9	5846
SI	77,3	9,6	13,1	10784
SK	85,9	13,4	0,7	6473
UK	87,7	11,2	1,2	8843

Source: EU-SILC 2014, own calculations.

8.2 Appendix 2: AROP and MD by working regime when currently working as self-employed

Table A2.1. At-risk of poverty rate among workers, by current employment status, individuals aged 18-64, 2014

	FT employee	PT employee	(a)	FT self-employed	(b)	PT self-employed	(c)	(d)
AT	4.6	8.4	***	12.1	***	21.4	*	(*)
BE	2.2	5.9	***	14.6	***	13.9		
BG	7.7	30.0	***	12.1	*	18.6		
CY	6.7	18.3	***	1.8	***	14.1		***
CZ	2.5	7.9	*	7.0	***	5.5		
DE	6.5	12.8	***	17.3	***	25.9	**	*
DK	1.9	9.4	***	18.4	***	7.9		
EE	8.7	19.1	***	30.5	***	36.9	*	
EL	6.5	27.3	***	21.6	***	28.0		
ES	6.6	23.3	***	24.5	***	21.9		
FI	1.6	6.9	***	12.4	***	21.9	**	(*)
FR	4.3	13.2	***	22.2	***	15.8		
HR	4.5	7.9		14.4	***	13.2		
HU	5.1	19.2	***	6.3		20.6		
IE	1.3	8.9	***	12.6	***	14.6		
IS	1.9	5.1	*	14.0	***	28.4	**	(*)
IT	6.5	16.9	***	19.6	***	22.6	(*)	
LT	6.4	21.8	***	11.6	*	35.0		*
LU	8.8	13.8	**	25.5	***	23.8		
LV	6.0	18.8	***	19.2	***	33.9	(*)	(*)
MT	3.9	12.9	***	14.3	***	11.0		
NL	3.0	4.8		12.8	***	8.9		
NO	3.1	8.4	***	12.0	***	19.8	(*)	
PL	6.7	13.2	***	24.0	***	28.0	***	
PT	6.4	29.3	***	29.4	***	37.9		
RO	6.2	37.6	*	53.3	***	63.8	*	*
SE	4.6	12.4	***	19.8	***	15.0		
SI	3.6	8.7	**	23.3	***	32.4	**	
SK	3.7	14.5	**	14.1	***	4.3	(*)	*
UK	3.9	16.1	***	20.1	***	18.9		

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) FT employees and PT employees; (b) FT employees and FT self-employed; (c) PT employees and PT self-employed; (d) FT self-employed and PT self-employed.

Source: EU-SILC 2014, own calculations.

Table A2.2. Material deprivation among workers, by current employment status, individuals aged 18-64, 2014

	FT employee	PT employee	(a)	FT self-employed	(b)	PT self-employed	(c)	(d)
AT	5.3	6.7		3.8		2.7	*	
BE	4.9	7.9	**	2.9	*	1.8	**	
BG	30.0	57.0	***	23.7	*	33.4	(*)	
CY	28.0	51.1	***	38.2	**	49.4		(*)
CZ	11.3	21.7	**	6.9	***	12.0		
DE	5.8	9.5	***	4.1		8.2		(*)
DK	2.5	7.8	**	0.7	**	2.4	(*)	
EE	10.5	16.6	*	3.5	***	9.8		
EL	25.5	48.7	***	32.9	***	46.8		**
ES	8.9	20.6	***	10.8		15.1		
FI	3.0	6.8	**	2.8		8.2		
FR	7.0	13.3	***	10.8	(*)	14.4		
HR	24.8	31.9		19.3	*	43.0		*
HU	31.6	51.7	***	13.3	***	26.9	*	
IE	9.9	22.4	***	8.5		16.1		(*)
IS	3.3	3.2		3.5		7.7		
IT	15.4	24.3	***	15.2		22.6		*
LT	16.1	27.3	**	13.2		27.4		
LU	3.5	4.3		2.2		3.5		
LV	24.3	36.5	**	19.6	(*)	29.5		
MT	13.2	23.3	**	12.0		7.8	**	
NL	4.2	5.6		4.2	*	2.2		
NO	1.6	4.1	**	1.9		3.0		
PL	14.3	26.5	***	14.2		24.1		**
PT	17.7	35.4	***	17.6		26.9		
RO	29.8	55.2	*	57.3	***	60.8		
SE	1.3	3.6	***	1.3		1.2	(*)	
SI	11.7	16.8	*	9.1	*	20.6		*
SK	14.4	27.5	**	9.9	**	6.3	**	
UK	7.8	15.9	***	8.8		7.7	***	

Note: *** p < 0.001; ** p < 0.01; * p < 0.1; (*) p < 0.5: significance t-test difference in poverty rates between (a) FT employees and PT employees; (b) FT employees and FT self-employed; (c) PT employees and PT self-employed; (d) FT self-employed and PT self-employed.

Source: EU-SILC 2014, own calculations.

8.3 Appendix 3: Depth of poverty median at-risk-of-poverty rate gap

Table A3.1. Relative median at-risk-of-poverty rate total population and among workers, individuals aged 18-64

	total population	only employee income	only self- employment income
AT	20.1	18.6	25.0
BE	18.8	11.9	29.7
BG	33.2	27.3	43.2
CY	18.5	18.6	12.9
CZ	18.0	12.1	18.3
DE	23.2	16.5	22.6
DK	18.8	26.5	40.2
EE	22.0	22.0	49.0
EL	31.3	21.5	31.3
ES	31.6	21.6	34.1
FI	13.9	12.7	31.5
FR	16.7	13.6	30.6
HR	27.9	15.8	28.0
HU	22.4	15.1	20.4
IE	17.6	11.0	28.3
IS	16.4	20.5	14.2
IT	28.2	21.4	34.2
LT	22.7	14.7	32.8
LU	16.3	12.3	32.0
LV	23.6	16.6	33.2
MT	17.8	12.3	18.9
NL	16.9	12.5	24.0
NO	21.3	17.4	33.7
PL	23.2	18.8	31.9
PT	30.3	21.4	37.4
RO	35.2	15.2	42.8
SE	20.4	18.6	26.8
SI	21.7	14.3	28.2
SK	29.0	15.3	18.4
UK	19.6	15.6	24.0

Source: EU-SILC 2014, own calculations.

Table A3.2. Average number of items deprived, total population and among workers, individuals aged 18-64

	total population	self-employed with employees	self-employed without employees	employees
AT	0,67	0,25	0,48	0,53
BE	0,78	0,21	0,34	0,48
BG	2,54	0,60	1,86	1,84
CY	1,88	2,08	2,07	1,67
CZ	1,13	0,37	0,70	0,92
DE	0,79	0,33	0,72	0,62
DK	0,68	(-)	1,40	0,51
EE	1,11	0,34	0,80	0,88
EL	2,07	1,18	1,97	1,57
ES	1,23	0,71	0,99	0,91
FI	0,65	0,27	0,48	0,45
FR	0,85	0,43	0,74	0,68
HR	1,97	1,02	1,59	1,61
HU	2,25	0,88	1,40	2,00
IE	1,42	0,55	1,01	1,06
IS	0,65	0,51	0,50	0,57
IT	1,36	0,66	1,24	1,08
LT	1,68	0,66	1,24	1,24
LU	0,48	0,28	0,28	0,42
LV	2,00	0,79	1,68	1,64
MT	1,35	0,92	1,00	1,07
NL	0,62	0,22	0,39	0,43
NO	0,33	(-)	0,21	0,24
PL	1,49	0,52	1,29	1,20
PT	1,53	0,89	1,34	1,24
RO	2,39	0,98	3,11	1,72
SE	0,34	0,20	0,23	0,24
SI	1,19	0,68	0,96	0,99
SK	1,41	0,48	0,93	1,09
UK	1,05	0,31	0,86	0,81

Source: EU-SILC 2014, own calculations.

8.4 Appendix 4: Profile characteristics the self-employed: country differences

Table A4.1. Profile characteristics by employment status (income definition), Europe 2014

sex:	same as average	all other countries
SE: more likely to be men	not significant	EE, LT, and LU
	other finding	/
education:	same as average	CY, EE, IE, MT, RO
SE: more low, less middle, less high skilled	not significant	BE, EE, ES, HU, NL, PT
	other finding	more low, more middle, less high skilled: DK, FI, HR, IS, LT, LV, NO more low, less middle, more high skilled: BG, and IT less low, more middle, less high skilled: CZ, FR, LU, and SK less low, less middle, more high skilled: AT, and DE
age:	same as average	AT, DE, HR, LT, LV, MT, NL, SK, UK
SE: less young, more prime age & elderly	not significant	/
	other finding	less young, less prime age, more old: BE, BG, CY, CZ, DK, EE, EL, more young, less prime age, more old: RO
children:	same as average	AT, HR, IE, LV, MT, PL
SE: less 0, less 1 more 2, more 3	not significant	BE, BG, CY, CZ, DE, DK, EE, ES, FR, IS, LT, LU, NL, SE
	other finding	more 0, less 1, less 2, more 3: EL, FI, NO, SI more 0, less 1, less 2, less 3: HU loss 0, less 1, more 2, more 3: IT, SK, UK
family type:	same as average	EL, SI

... continued

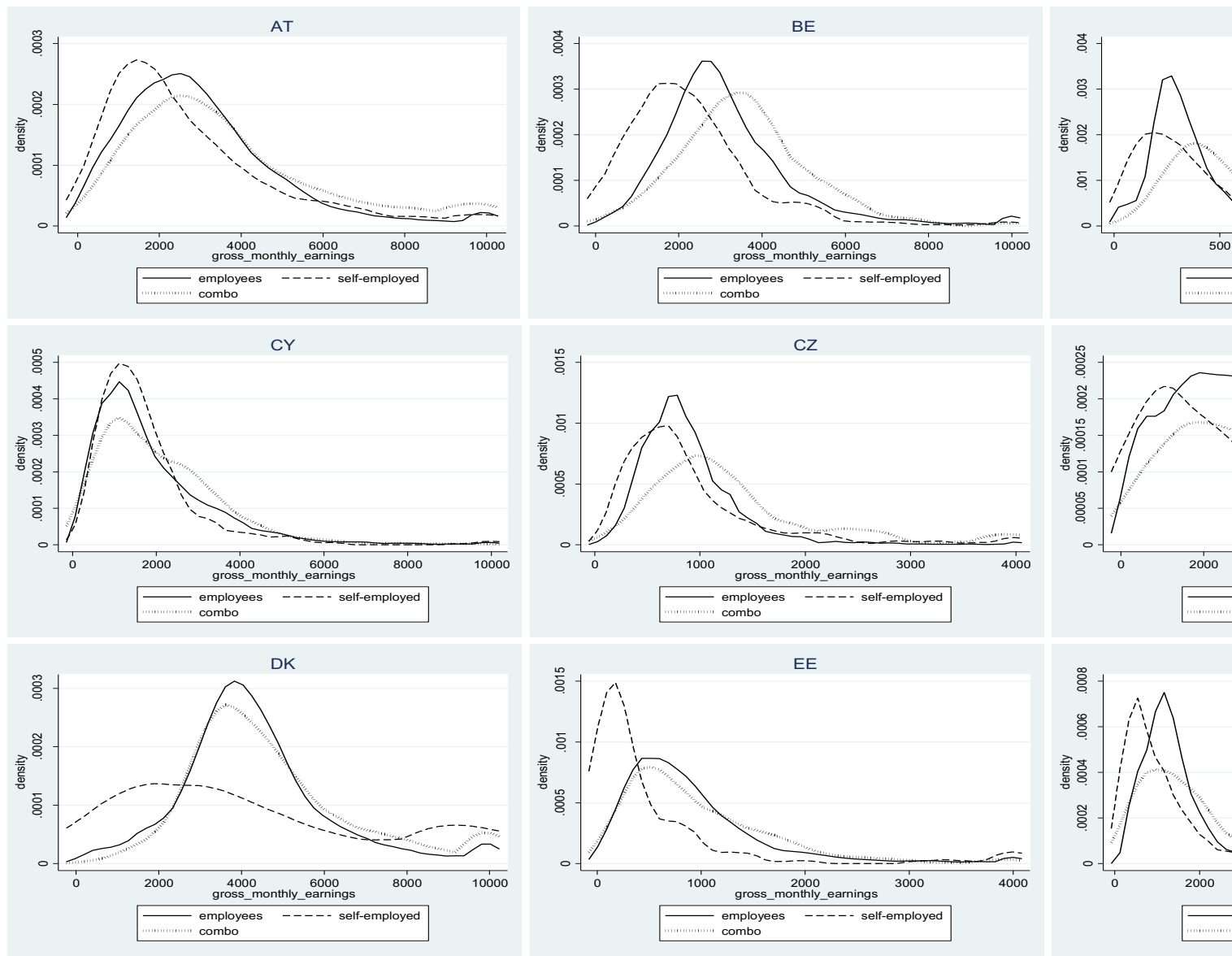
SE: less single, less couple, more other	not significant	AT, BE, BG, CY, DK, EE, ES, FR, HR, IS, IT, LT, LU, MT, NL, NO, PL, PT,
	other finding	less single, more couple, less other: CZ, LV, SK
		less single, more couple, more other: FI, IE
		more single, more couple, less other: HU
		more single, less couple, more other: RO
household work-intensity:	same as average	EE, IS, LT, LV, MT, SE, SI, SK, UK
SE: more]0, 0.8], less]0.8, 1]	not significant	BG, CZ, DK, FI, HR, IE, IT, LU, NO, PL, PT
	other finding	more]0,0.5], less]0.5, 0.8], less]0.8, 1[, more 1 : AT, BE, NL
		more]0,0.5], more]0.5, 0.8], more]0.8, 1[, less 1 : CY, RO
		less]0,0.5], more]0.5, 0.8], less]0.8, 1[, more 1 : DE
		less]0,0.5], more]0.5, 0.8], more]0.8, 1[, less 1 : EL
		less]0,0.5], less]0.5, 0.8], less]0.8, 1[, more 1 : ES, FR, HU
low earnings:	same as average	all other countries
SE: more low earnings	not significant	CY, LT
	other finding	/

Note: SE = Self-employed.

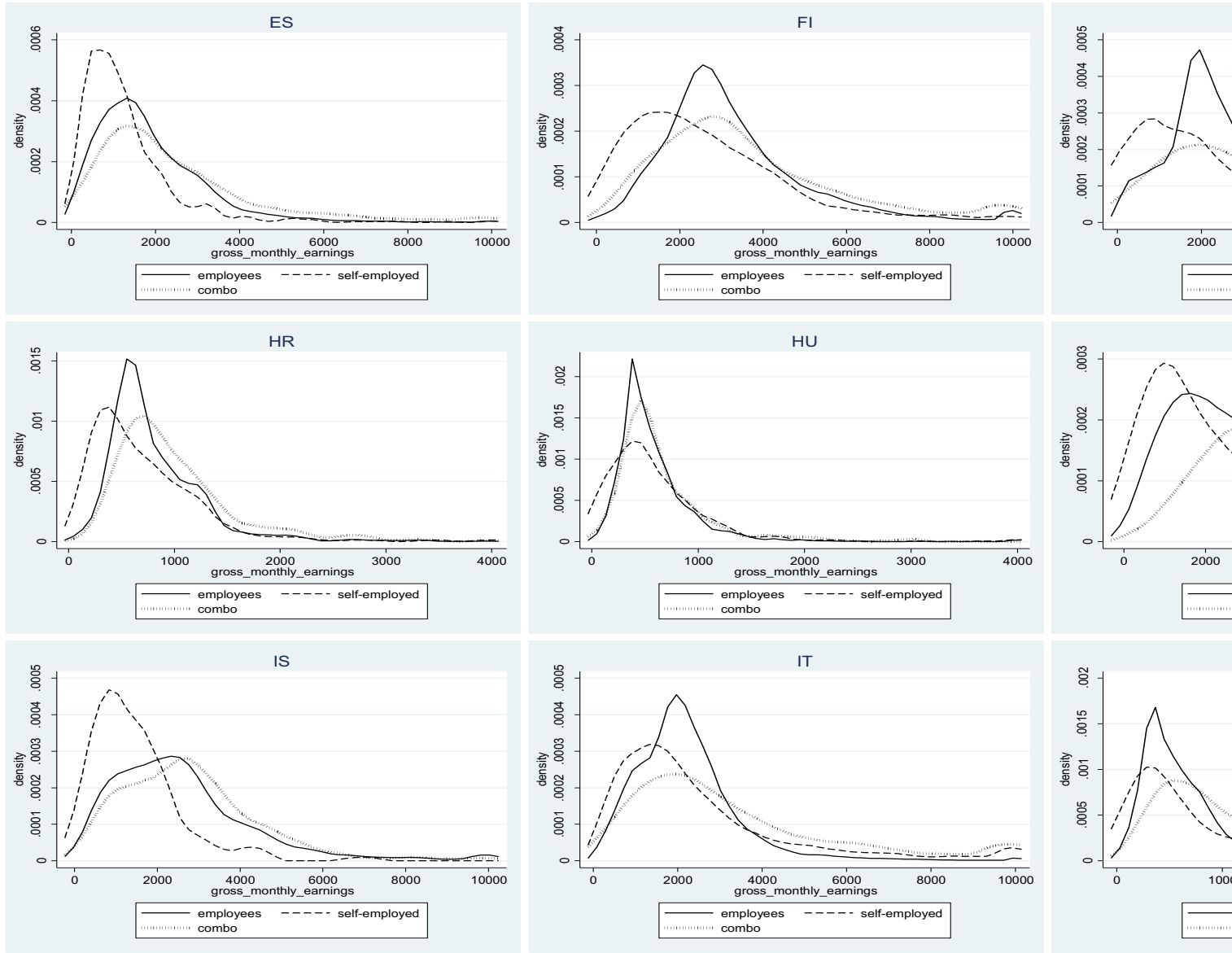
Source: EU-SILC 2014, own calculations.

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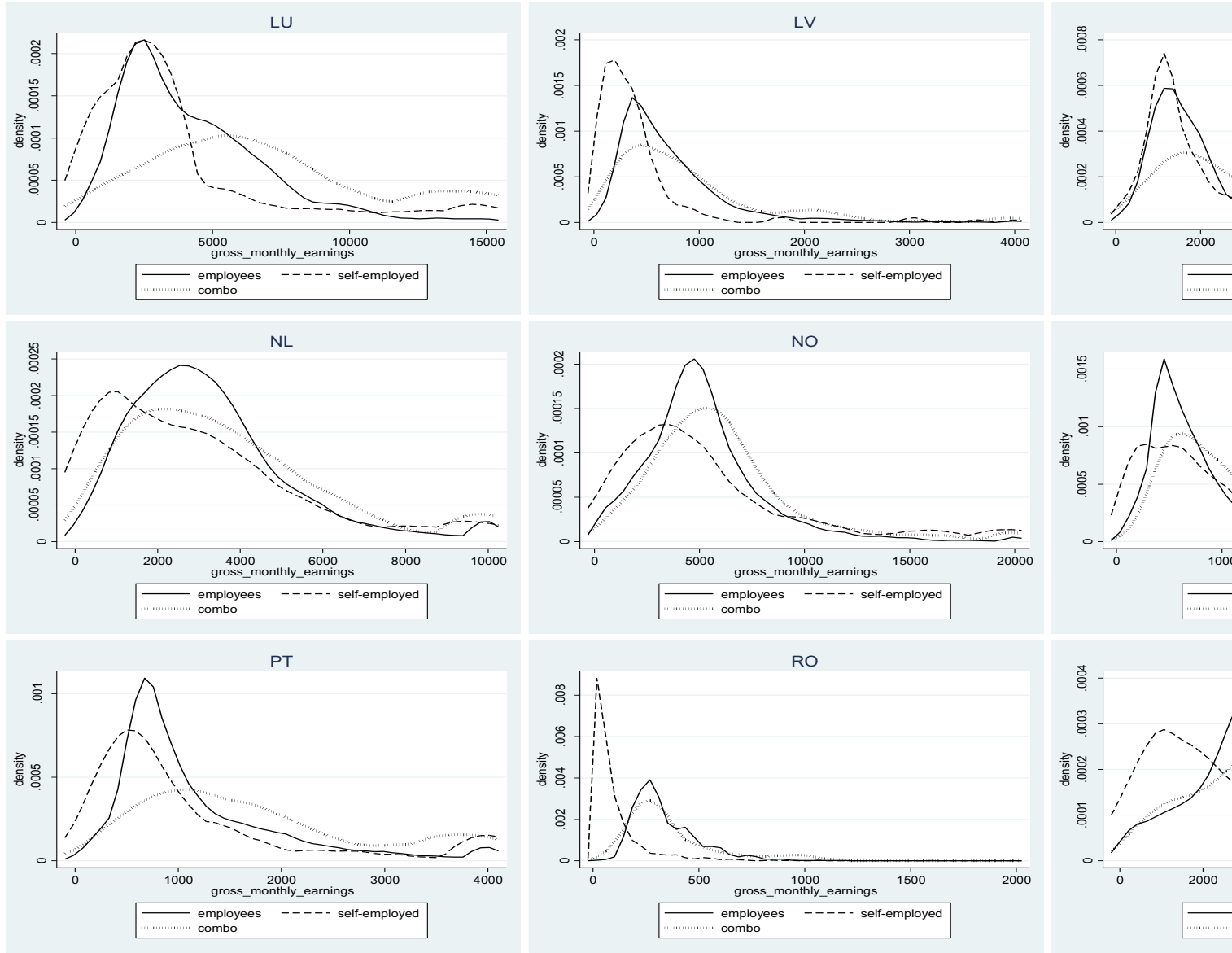
Appendix 5: Kernel distributions of earnings of employees (solid line), self-employed (dash), and
(dots), European countries, 2014



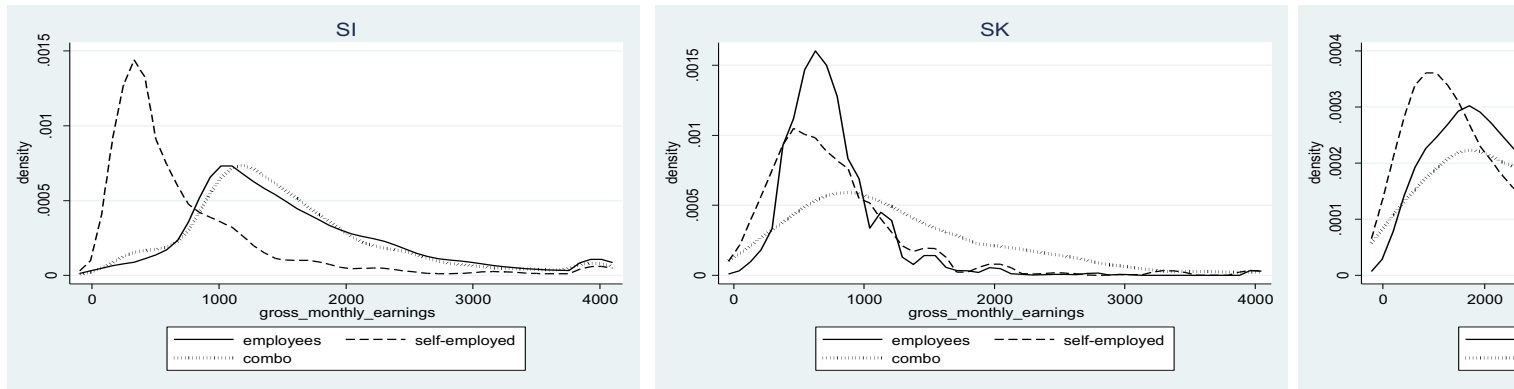
Appendix 5 Kernel distributions of earnings of paid employees, self-employed, and individuals combining income s



Appendix 5 Kernel distributions of earnings paid employees, self-employed, and individuals combining income sou



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Note: self-employment , employee, and 'combo' are defined by income source.

Source: EU-SILC 2014, own calculations.

