Article:
Williams, C.C. orcid.org/0000-0002-3610-1933 (2020) Explaining the variations in the magnitude of undeclared work across the 28 European Union member states. Economic Alternatives, 2020 (2). pp. 203-223. ISSN 1312-7462

10.37075/ea.2020.2.01

Explaining the variations in the magnitude of undeclared work across the 28 European Union member states

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Forthcoming
Economic Alternatives

Summary

This paper evaluates the competing theories that seek to explain the greater magnitude of undeclared work in some nations than others. These theories variously explain the higher levels of undeclared work in some nations to be determined by either economic under-development and the lack of modern governance ("modernisation" theory), higher taxes and state over-interference ("neo-liberal" theory) or inadequate government intervention in work and welfare ("political economy" theory). Reporting data on the magnitude of undeclared work in the 28 member states of the European Union using the labour input method, the finding is that undeclared work is higher in EU member states with lower levels of GDP per capita, less modernised systems of government, higher levels of corruption, social transfers are less effective at reducing poverty, and there are lower levels of public expenditure on labour market interventions to protect vulnerable groups. The theoretical and policy implications are then discussed.

Keywords: informal sector; tax evasion; economic development; European Union.

JEL classification: H26, J46, K42, O17, P37

1. Introduction

It is now recognised that undeclared work, although prevalent in all European Union (EU) member states, significantly varies in its magnitude across countries (Dotti *et al*., 2015; Medina and Schneider, 2017; Williams, 2014b; Williams and Schneider, 2016). This means that the impacts of undeclared work are greater in some EU member states than others. Undeclared workers find themselves having to accept poorer working conditions, lower wages, infringements of their labour rights and reduced protection under labour and social protection law, thus depriving themselves of adequate social benefits, pension rights and access to healthcare, as well as skills development and lifelong learning opportunities (European Commission, 2016; ILO, 2015). The prevalence of these vulnerable undeclared workers, however, varies across the EU member states. So too does the extent of unfair competition felt by businesses operating legitimately vary across countries, as does the level of reduced tax and social security revenues vary significantly between member states (European Commission, 2016; Williams, 2014, 2018).

How, therefore, can these cross-country variations be explained? And what does this teach us about how undeclared work should be tackled? In recent years, the issue of explaining and tackling undeclared work has been high on the political agenda in the EU, exemplified by the European Commission establishing the European Platform Tackling Undeclared Work (European Commission, 2016). Until now, however, relatively few attempts have been made

to evaluate the competing theories that variously explain the variations in the magnitude of undeclared work across countries. This paper seeks to fill that gap.

Therefeore, the aim of this paper is to advance understanding of the determinants of undeclared work by evaluating three competing theories for the greater magnitude of undeclared work in some nations rather than others. These variously explain undeclared work as resulting from either economic under-development and the lack of modern governance ("modernisation" theory), higher taxes and too much state intervention ("neo-liberal" theory) or inadequate government intervention in work and welfare provision ("political economy" theory).

To advance understanding, the first section briefly reviews how undeclared work can be measured, and how the cross-country variations in the prevalence of undeclared work have been variously explained from the perspectives of modernisation, neo-liberal and political economy theory. Revealing that the only attempts so far to evaluate these contrasting explanations have used a limited range of measurement methods and datasets, this paper introduces a new dataset and measurement method. The second section then introduces the Labour Input Method (LIM) here used to measure the cross-country variations in the prevalence of undeclared work across the European Union, along with the indicators used to evaluate the validity of the contrasting theories. The third section reports the results on the cross-national variations in the magnitude of undeclared work and the validity of the contrasting theories using bivariate regressions, followed in the fourth and final section by a discussion of the implications for theory and policy, and future research required.

At the outset, however, undeclared work needs to be defined. Undeclared work has been variously denoted using some 45 different nouns and 10 adjectives, including the "cash-in-hand", "shadow", "informal", "black" and "underground" economy/sector/work (Williams, 2004). Despite this, a strong consensus exists in both the scholarly and policy-making communities in terms of how this economic activity can be defined. The view is that what is here termed "undeclared work" can be defined by what is absent from, or insufficient about, it compared with declared work, and the consensus is that the only absence from, or insufficiency about, undeclared work is that this paid work is not declared to the authorities for tax, social security and/or labour law purposes when it should be declared (European Commission, 1998, 2007, 2016; OECD, 2002; Williams, 2004, 2017; Williams and Windebank, 1998). If paid work possesses other absences or insufficiencies, then it is not undeclared work. For example, if the goods and/or services exchanged are illegal (such as illegal drugs), then this is not undeclared work but part of the wider criminal economy. If it is unpaid, meanwhile, it is not undeclared work but part of the unpaid sphere.

2. Measuring and explaining undeclared work: a review

Measuring the magnitude of undeclared work

By definition, undeclared work is not declared to the authorities. Therefore, measuring its size is difficult. Examining the cross-national variations in the magnitude of undeclared work is even more problematic because harmonised definitions and survey methods are rare. Despite these problems, there have been in recent decades various attempts to measure the national and cross-national variations in the magnitude of undeclared work. Two methods have been used, namely indirect survey methods which use either proxy indicators of the magnitude of undeclared work or seek statistical traces of the magnitude of undeclared work in macroeconomic data collected for other purposes (Williams and Schneider, 2016), and direct surveys (OECD, 2002, 2012; Ram and Williams, 2008; Williams, 2004).

Indirect methods involve four main techniques: the use of individual non-monetary proxy indicators such as the number of very small enterprises (ILO, 2002) or electricity demand (e.g., Friedman *et al.,* 2000; Lacko, 1999); the use of individual monetary proxy indicators such as the level of cash deposits (Gutmann, 1977) or money transactions (Feige, 2012; Frey and Weck, 1983), the use of discrepancies such as income/expenditure discrepancies at either the aggregate or individual level (Paglin ,1994) or labour inputs according to different surveys (Williams *et al*., 2017), and the use of multiple proxy indicators (e.g., Schneider, 2013; Schneider and Williams, 2013).

Direct surveys, meanwhile, interview respondents about their participation in undeclared work. Cross-country surveys include a three-country comparison of some European countries (Pedersen, 2003), a 2007 and 2013 special Eurobarometer survey of undeclared work across the European Union (Williams, 2013; Williams and Windebank, 2015), a study of earlier International Labour Organization (ILO) data of informal employment in 41 less developed economies (Williams, 2015a) and employment in the informal economy in 36 countries (Williams, 2015b). These tend to under-estimate its magnitude due to participants being unwilling to report illegitimate activity in interviews.

The consensus in the scholarly and practitioner literature is to use indirect methods, using macroeconomic data collected and/or constructed for other purposes, to measure the magnitude of undeclared work. Meanwhile, direct survey methods are advocated to identify its characteristics in terms of who engages in undeclared work, what they do and why, so as to inform policy development (Eurofound, 2013; European Commission, 2007; Williams and Schneider, 2016).

Until now, the main indirect method used to evaluate the magnitude of undeclared work has been the multiple indicators multiple causes (MIMIC) method (Schneider and Williams, 2013). The problem, however, is that many of the indicators assumed in this method to be causes of undeclared work (e.g., high social expenditure, high taxes) have been questioned in recent years and the direction of the association found to be the opposite of what is suggested in this MIMIC method (see for example, Williams, 2013).

Here, therefore, an alternative indirect measurement method, namely the LIM, will be used to measure the size of the undeclared economy (OECD, 2002). The LIM uses macroeconomic data to measure, for each member state, the discrepancy between the reported supply of labour inputs by workers (from the Labour Force Survey) and demand side data on recorded labour use from employers (e.g. from enterprise surveys, company declarations to tax or social security authorities, or national statistical offices). The discrepancy between the two provides an estimate of magnitude of undeclared work. This method will be described in greater detail below in the methodology section.

Explaining cross-national variations in undeclared work

Reviewing the scholarship explaining the variable magnitude of undeclared work across nations, it becomes quickly apparent that this has been variously theorised as resulting from either economic under-development and a lack of modernisation of governance (modernisation theory), state over-interference in the free market (neo-liberal theory) or inadequate state intervention in work and welfare (political economy theory). Each theory is here considered in turn.

During the twentieth century, undeclared work was predominantly viewed as a leftover from a pre-modern mode of production that was disappearing. Consequently, little attention was paid to the undeclared economy since it was perceived as a residue and dwindling. Economies in which undeclared work still prevailed were termed "under-developed" and even "backward" compared with economies in which the modern formal economy dominated, which

were viewed as "advanced" and "developed" (Geertz, 1963; Gilbert, 1998; Lewis, 1959). From this modernisation perspective, in consequence, undeclared work is more prevalent in less developed economies with a lack of modern governance, and the consequent solution is to focus upon promoting economic development and the modernisation of government, such as by tackling public sector corruption. In this modernisation theory, in consequence, corruption and undeclared work are seen as complements; increased corruption, which acts like an additional tax increasing the regulatory burden, leads to higher levels of undeclared work (Buehn and Schneider, 2012; Dreher and Schneider, 2010; Goel and Saunoris, 2014; Hibbs and Piculescu, 2005; Wallace and Latcheva, 2006). To test the validity of modernisation theory, therefore, the following hypothesis can be evaluated:

> *Modernisation hypothesis (H1)*: undeclared work is more prevalent in countries with: (*H1a*) less developed economies and (*H1b*) less modern governance.

The recent realisation that undeclared work remains extensive (ILO, 2018; Schneider and Williams, 2013) and a persistent feature of all economies, even in countries witnessing economic development and modernisation (Williams and Schneider, 2016), has led to the emergence of new theorisations. For neo-liberal theory, when there is state over-interference in the economy and welfare, participation in undeclared work is a rational economic strategy voluntarily pursued by workers and enterprises to escape the declared economy due to the excessive costs, time and effort required to operate in the declared sphere (e.g., Becker, 2004; London and Hart, 2004; Nwabuzor, 2005; Sauvy, 1984). For these neo-liberal scholars, undeclared work is rational economic decision for workers and enterprises facing high taxes and over-regulation (De Soto, 1989, 2001; Perry and Maloney, 2007). The magnitude of undeclared work is therefore viewed as higher in countries with higher taxes and greater levels of state interference and the consequent solution is to reduce taxes, de-regulate the economy and reduce state support for welfare provision. For neo-liberal commentators (Loayza, 2007; Schneider and Enste, 2000; Schneider and Klinglmair, 2004; Schneider *et al.*2010), therefore, the main causes of undeclared work are high tax and social security contribution burdens (Cebula, 1997; Feld and Schneider, 2010; Friedman *et al.,* 2000; Giles, 1999; Giles and Tedds, 2002; Hill and Kabir, 1996; Johnson *et al.,* 1998; Schneider, 2005; Tanzi, 1999). To test the validity of this neo-liberal theory, the following hypothesis can be evaluated:

> *Neo-liberal hypothesis (H2)*: undeclared work is more prevalent in countries with: (*H2a*) higher tax rates and (*H2b*) higher levels of state interference in the free market.

The inverse of this is argued by political economy scholars. Undeclared work is asserted to directly result from the advent of a de-regulated open global economy (Castells and Portes, 1989; Davis, 2006; Gallin, 2001; Hudson, 2005; Slavnic, 2010), and outsourcing and subcontracting are key means by which undeclared work has become integrated into contemporary capitalism. Contrary to modernisation theory, "the informal economy is far from a vestige of earlier stages in economic development. Instead, informality is part and parcel of the processes of modernization" (Fernandez-Kelly 2006: 18). Therefore, this is a largely unregulated sphere involving low-paid insecure work conducted under "sweatshop-like" conditions as a survival tactic by marginalised populations (Castells and Portes, 1989; Davis, 2006; Gallin, 2001; ILO, 2002). From this political economy perspective, undeclared work is a result of low state intervention in the economy and welfare, and the lack of protection of workers. As such, undeclared work is higher when taxes are lower, public expenditure as a proportion of GDP is lower, and there are lower levels of social protection. To test the validity of this political economy theory, the following hypothesis can be evaluated:

Political economy hypothesis (H3): undeclared work is more prevalent in countries with lower levels of state intervention in work and welfare.

Evaluations of the competing explanations

Until now, the cross-national variations in the magnitude of undeclared work have been predominantly explained using one of the above three "logics". In a small minority of studies, nevertheless, it has been argued that different theories apply to different populations or activities, such as political economy explanations to undeclared waged employment and neo-liberal explanations to undeclared self-employment (Perry and Maloney, 2007; Williams *et al.*, 2013), or political economy explanations to relatively deprived populations and neo-liberal explanations to relatively affluent populations (Evans *et al.,* 2006; Pfau-Effinger, 2009; Williams, 2004).

Until now, however, there have been only a few evidence-based evaluations of the validity of these competing theories when explaining cross-national variations in the magnitude of undeclared work. The exceptions are two studies using the 2007 and 2013 special Eurobarometer survey of the member states of the European Union (Williams, 2013; Williams and Windebank, 2015), and studies of earlier ILO data on informal employment in 41 less developed economies (Williams, 2015a) and employment in the informal economy in 36 developing countries (Williams, 2015b). All find evidence to support the tenets of both the modernisation and political economy theories but little evidence to support neo-liberal theory. All these studies, however, are based on data from direct survey methods. No indirect measurement methods have been used to evaluate these competing theories. This is because the main indirect measurement method used, namely the MIMIC method, is based on the neo-liberal assumptions that high tax and social security burdens lead to an increased prevalence of undeclared work. Here, therefore, an alternative indirect measurement of undeclared work is used to test these competing explanations which makes no such assumptions from the outset and enables the validity of these findings to be tested using an alternative source of data and different measure of undeclared work.

3. Data and methods

The Labour Input Method (LIM) is an indirect measurement of the magnitude of undeclared work. It examines the discrepancy between the reported labour supply by workers (from the Labour Force Survey) and the reported use of labour by employers (e.g. from enterprise surveys, company declarations to tax or social security authorities, or national statistical offices). This discrepancy provides an estimate of the magnitude of undeclared work. The underpinning assumption is that businesses deliberately hide some of their labour input, and that by identifying the discrepancies in the labour inputs reported by businesses in enterprise surveys, and the labour inputs reported by workers in labour force surveys, an estimate of the magnitude of undeclared work can be achieved. Therefore, the LIM has four stages (OECD, 2002):

- Estimate the labour input from the demand-side using enterprise surveys;
- Estimate the labour input from the supply-side using a labour force survey (LFS) supplemented by population registers or census data if these are available;
- Standardise these estimates using the same units of labour input, such as hours in employment or full-time equivalent workers;

- Compare the two estimates and evaluate potential discrepancies taking account of the reliability of the different sources.

The OECD (2002) suggests a process for converting these discrepancies in labour inputs into an estimate of this as a percentage of gross value added (GVA). It states that analysts should:

1) Produce labour supply estimates disaggregated at the level of economic activity and size of enterprise or type of labour (employees, self-employed), from a labour force survey and/or other supplementary demographic source;
2) Produce estimates of output per unit of labour input and value added per unit of labour input for the same activity and size breakdown from regular statistical enterprise surveys; and
3) Multiply the labour input estimates from (1) using ratios expressed in the per unit terms which results in output and value added for the activity and size categories.

The labour inputs estimated in stage 1 are used as weights that should be applied to the enterprise survey output estimates and value added per unit of labour input (derived in stage 2). To calculate the undeclared work component of the GVA, ratios of output and value added per unit of labour input are used, taken from enterprise surveys (SBS).

Therefore, the discrepancy in labour inputs from the supply- and demand-side are here reported for each EU member state for the year 2013 (for a detailed analysis, see Williams *et al*., 2018). The demand-side labour inputs are calculated using the national accounts (NAs) while the supply-side inputs are calculated using the European Labour Force Survey (EU-LFS). Given that the structural business statistics (SBS) cover only the private sector, the estimate of the magnitude of undeclared work is limited to the share of labour inputs in the private sector that is undeclared work.

To evaluate the various theorisations for the higher levels of undeclared work in some nations, macro-level indicators are used. To test the modernisation theory that the level of economic development is an important determinant of cross-national variations in the magnitude of undeclared work (using the LIM estimate of the scale of undeclared labour as a percentage of total labour inputs in the private sector), GDP per capita is used (ILO, 2012; Yamada, 1996). Meanwhile, two indicators test the quality of government tenet of modernisation theory: the European Quality of Government index, and the Corruption Perceptions index. The neo-liberal theory that undeclared work is a result of high tax rates and state over-interference and conversely, the political economy theory that it is due to state under-intervention in work and welfare, the indicators used are: the level of public expenditure on labour market interventions to protect vulnerable groups; the impact of social transfers in reducing poverty, and the implicit tax rate (ITR) on labour. See Table A1 in the Appendix for details of each indicator and the data sources.

To analyse whether there is a statistically significant relationship between cross-national variations in the magnitude of undeclared work and the economic and social conditions that each theory posits are associated, bivariate regression analysis is undertaken. Here, Spearman's rank correlation coefficient (r_s) is used due to the non-parametric nature of the data to discover whether the statistically significant associations are strong and very strong ($r_s > 0.7$).

4. Results: evaluating the competing theories

In the EU, the finding is that 11.6% of total labour input in the private sector is undeclared work (see Figure 1), and undeclared work constitutes on average 16.4% of GVA in the private sector (see Figure 2). Interestingly, this latter figure is higher is because undeclared labour is found to be concentrated in sectors where labour productivity is higher.

However, these figures are unweighted averages, not accounting for the relative size of the labour force in each country (Eurostat, 2017). The weighted averages are 9.3% of total labour input in the private sector is undeclared work, and undeclared work constitutes 14.3% of GVA in the private sector. The weighted average is lower than the unweighted average due to the influence of larger countries such as Germany, France and the United Kingdom, which have larger labour forces and relatively lower levels of undeclared work.

As Figure 1 displays, there are large differences in the magnitude of undeclared work between member states. The member states with undeclared economies larger than the EU average are largely new EU member states (NMS). Only Italy is included among the older members. Only the Czech Republic from the NMS has a smaller than EU average undeclared economy. The lowest share of undeclared work in terms of labour input is in the United Kingdom, Germany and the Netherlands where less than 3% of the total labour input is undeclared work. Alternative measures of undeclared work, capturing the informal employment or the shadow economy are available in Table 1.

INSERT FIGURE 1 ABOUT HERE

As Figure 2 reveals, the distribution of countries does not significantly alter when undeclared work is analysed as a proportion of GVA in the private sector. Undeclared work is highest in Poland, Romania and Lithuania where it is greater than 25% of total GVA created in the private sector. Countries with undeclared economies larger than the EU average are again mostly new member states (Hungary, Latvia, Estonia, Bulgaria, Cyprus, Croatia and Czech Republic) along with only three older EU members: Greece, Spain and Italy. Only Slovakia and Slovenia from the group of NMS countries have undeclared economies slightly below the EU average. It is to be noted, that even in the economy with the lowest share of undeclared work, namely Germany, it is still 7% of private sector GVA.

INSERT FIGURE 2 ABOUT HERE

Not only the magnitude of undeclared work but also the character of undeclared work differs across EU member states. As Figure 3 reveals, in the EU, 61.8% of all undeclared work is conducted by employees, 37.3% by the self-employed and 0.3% by family workers (i.e. persons working in a family business or on a family farm without pay and who are living in the same household as the owner of the business or farm and receive remuneration in the form of fringe benefits or payments in kind). However, this varies across countries.

In some countries, the undeclared economy is largely composed of undeclared self-employment (e.g. Cyprus, Netherlands and Portugal) but this is not the case in others. In a significant number of countries, such as Bulgaria and Poland, it is much more an issue related to undeclared waged employment where employees are employed on either a wholly undeclared (i.e. unregistered) basis or are engaged in semi-declared employment (i.e. with a portion of their salary being paid as an undeclared envelope wage). Comparing Poland and Denmark for example, in Poland, 25.3% of dependent employment is undertaken in the undeclared economy (measured in terms of total labour inputs), but only 2.5% of self-employment is in the undeclared economy, and 5.7% of the labour inputs of family workers are undeclared. The result is that 98% of all undeclared work is conducted by employees. In Denmark, in stark contrast, only 3.0% of dependent employment is conducted in the undeclared economy, but 58.9% of self-employment and 58.9% of family work. The result is that 71.5% of all undeclared work is conducted by the self-employed. Until now, no studies have sought to explain these cross-country differences in the character of undeclared work. However, they

are likely to be the product of national specificities, such as the structure of their labour market, and different national legislative contexts.

INSERT FIGURE 3 ABOUT HERE

These cross-country differences in the structure of the undeclared labour market across the EU have significant implications for tackling undeclared work. Policy initiatives to help business start-up declared, such as aiding entrepreneurs to make the transition from unemployment to self-employment, will be useful in Denmark (and other countries where most undeclared work is conducted by the self-employed) and less relevant in Poland and other countries where most undeclared work is conducted by employees. Meanwhile, policy initiatives to tackle unregistered or under-declared waged employment, such as the use of notification letters to change the behaviour of employers and employees, will be relevant in Poland and other countries where undeclared work is mostly undertaken by employees, but less relevant in Denmark and other countries where undeclared work is mostly conducted by the self-employed. However, it is not only that policy measures need to be tailored to countries according to the character of their undeclared work.

Explaining cross-national variations in undeclared work in the European Union

Using the LIM data, an analysis can be undertaken of the relationship between cross-national variations in the magnitude of undeclared work and the economic and social characteristics that each theorisation views as determinants. Given the small sample size of 28 countries and lack of necessary controls to include in a multivariate regression analysis, it is only possible here to conduct bivariate regression analyses. To do this, Spearman's rank correlation coefficient (r_s) is used due to the non-parametric nature of the data. Despite the limitation of only using bivariate regression analysis, there are some meaningful findings regarding the validity of the different theoretical explanations.

Previous studies, using direct survey data, reveal that undeclared work is higher in Member States with: lower levels of GDP per capita; less modern institutions of governance, displayed by higher levels of public sector corruption and lower qualities of governance; lower expenditure as a percentage of GDP on active labour market policies; lower levels of social expenditure; and less effective social transfer systems (Vanderseypen *et al.*, 2013; Williams, 2014a,b,c; 2015a,b; Williams and Horodnic, 2015, 2016, 2017; Williams and Kedir, 2018a,b,c; Williams and Krasniqi, 2018; Williams *et al.,* 2015). Therefore, it is here tested whether similar finding result when using the indirect LIM.

First, the validity of modernisation theory is evaluated, using the LIM estimate of the scale of undeclared work as a percentage of total labour inputs in the private sector. The finding is that there is a strong significant relationship between cross-national variations in the magnitude of undeclared work and cross-national variations in GDP per capita in purchasing power standards (r_s=-.783***). The greater the level of GDP per capita in purchasing power, the smaller is the scale of undeclared work. As Figure 4 reveals, countries such as Bulgaria, Romania and Latvia with relatively low levels of GDP per capita have higher levels of undeclared work, whilst countries with relatively high levels of GDP per capita (such as Luxembourg, Netherlands, Ireland) have relatively lower levels of undeclared work. This confirms hypothesis *H1a.*

INSERT FIGURE 4 ABOUT HERE

There is also a strong significant correlation between cross-national variations in the level of undeclared work and cross-national variations in the quality of government as measured by the European Quality of Government Index (EQI). This index includes measures of both perceptions and experiences with public sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality (Charron *et al*., 2015). As Figure 5 reveals, the higher is the quality of government, the lower is the level of undeclared work (r_s= -.686 ***). Countries such as Romania and Bulgaria with low rankings on the European Quality of Government index have higher levels of undeclared work, whilst countries such as Denmark, Finland and Sweden, with higher scores on this index, have relatively lower levels of undeclared work. This confirms hypothesis *H1b*.

INSERT FIGURE 5 ABOUT HERE

Reinforcing this, there is a significant correlation between the magnitude of undeclared work and the perceived level of corruption, as measured by Transparency International's Corruption Perceptions Index. This ranks each member state based on perceptions of public sector corruption. A country's score indicates the perceived level of public sector corruption on a scale of 0 - 100, where 0 means that a country is perceived as highly corrupt and 100 means it is perceived as very clean[1]. The finding is that the higher is the perceived level of corruption, the higher is the level of undeclared work (r_s=-.597***). This further confirms hypothesis *H1b*. Modernisation theory is therefore confirmed. The higher is the level of GDP per capita in purchasing power standards, the greater the quality of government and the lower is the perceived level of corruption, the lower is the magnitude of undeclared work.

INSERT FIGURE 6 ABOUT HERE

Examining the validity of neo-liberal theory and political economy theory, the first finding is that the higher the active labour market policy expenditure (as a percentage of GDP) on labour market policy (LMP) interventions, covering the range of financial and practical supports offered by governments to people who are unemployed or otherwise disadvantaged in the labour market, the lower is the level of undeclared work (r_s=-.507***). As Figure 7 reveals, countries such as Romania, Lithuania and Latvia with relatively low levels of expenditure on labour market policy interventions targeting vulnerable groups, have larger undeclared economies. Meanwhile, countries such as Denmark and Spain with higher levels of such expenditure have a lower prevalence of undeclared work. This, therefore, confirms the political economy explanation that greater state intervention reduces undeclared work (H3) and refutes the neo-liberal explanation (H2b) that state over-interference in the free market increases the scale of undeclared work.

INSERT FIGURE 7 ABOUT HERE

This is further reinforced when examining the impact of social transfers on reducing poverty, with poverty defined as the proportion of people with an income below 60% of the national median income. The greater the impact of social transfers on reducing poverty in a member state, the lower is the level of undeclared work (r_s= -.570***). As Figure 8 reveals, member states such as Romania, Bulgaria, Poland and Greece where social transfers have a limited

[1] A country's rank indicates its position relative to the other countries included in the index. The index for 2013 includes 177 countries.

impact on reducing poverty have higher levels of undeclared work than member states where social transfers have greater impact on reducing poverty, such as Ireland, Denmark and Finland. This therefore provides further evidence to confirm the political economy explanation that greater state intervention reduces undeclared work (H3) and refutes the neo-liberal explanation (H2b) that state over-interference in the free market increases the magnitude of undeclared work.

INSERT FIGURE 8 ABOUT HERE

Finally, although there are considerable variations in the tax burden on labour income across Member States, there is no significant association with the level of undeclared work (r_s=-.142). Member States with low tax burdens on labour such as the UK, Portugal and Bulgaria have relatively low, medium and high levels of undeclared work, and Member States with high tax burdens on labour do not have higher levels of undeclared work. Indeed, although not statistically significant, the line of best fit is downwards suggesting that as the tax burden increases, the level of undeclared work decreases. As such, there is no evidence to support the neo-liberal hypotheses that the higher is the tax burden, the higher is the level of undeclared work (not confirming *H2a*).

5. Discussion and conclusions

To explain cross-national variations in the magnitude of undeclared work, this paper has evaluated three theories that variously explain a higher prevalence of undeclared work to be driven by economic under-development and corruption (modernisation theory), state over-interference (neo-liberal theory) or inadequate state intervention in work and welfare (political economy theory). Reporting estimates of the magnitude of undeclared work using the Labour Input Method (LIM), the finding is 9.3% of total labour input in the private sector in the EU is undeclared, and undeclared work constitutes 14.3% of GVA in the private sector.

However, there are significant cross-national variations in the magnitude of undeclared work. Evaluating the validity of the competing explanations for these cross-national variations using bivariate regressions, the structural economic and social conditions that result in lower levels of undeclared work have been identified. This has revealed that undeclared work is lower in member states with higher levels of GDP per capita, with more modernised systems of government, lower levels of corruption, and in which social transfers are effective at reducing poverty, and there are higher levels of public expenditure on labour market interventions to protect vulnerable groups. In consequence, this confirms the tenets of the modernisation and political economy theories but finds no support for the tenets of neo-liberal theory.

This reinforces earlier theoretical findings in relation to the European Union (Williams, 2013; Williams and Windebank, 2015). However, all these previous studies at an EU level have used the same direct survey method and dataset, namely a Eurobarometer survey based on face-to-face interviews. Until now, there has been no confirmation of whether the findings are similar when using indirect measurements and other datasets. This paper has confirmed that this is the case when the labour input method is used. It confirms the need for a synthesis of the tenets of modernisation and political economy theory when explaining cross-national variations in the magnitude of undeclared work in what can be termed a “neo-modernisation” theory.

These findings also have major policy implications. Besides the need for enforcement authorities, such as labour inspectorates, tax administrations and social insurance authorities, to find more effective measures for transforming undeclared work into declared work (Eurofound, 2013; ILO, 2015, 2017; Williams, 2017), this paper reveals that addressing

broader economic and social conditions associated with the overarching modernisation of economies, state bureaucracies and social protection are also important. In other words, it reveals that although enforcement authorities can perhaps deal with the effects of undeclared work, it is wider national governments that need to address the broader economic and social drivers that lead workers and businesses to operate in the undeclared economy.

In conclusion, this paper has shown that the magnitude of undeclared work is lower in member states with higher levels of GDP per capita, with more modernised systems of government, lower levels of corruption, and in which social transfers are effective at reducing poverty, and there are higher levels of public expenditure on labour market interventions to protect vulnerable groups. If this paper encourages a further testing of these correlations using more refined multivariate regression analysis to evaluate whether the same relationships hold, as well as encourages the collection of data to allow this to happen, then a first intention of this paper will have been achieved. This type of data should be collected and collated from various currently disconnected databases (e.g., Eurostat, Transparency International, World Bank) and, for more robust results, should cover longitudinal analysis. If this article also facilitates understanding of the importance of addressing wider economic and social conditions when tackling undeclared work, then its broader intention will have been also achieved.

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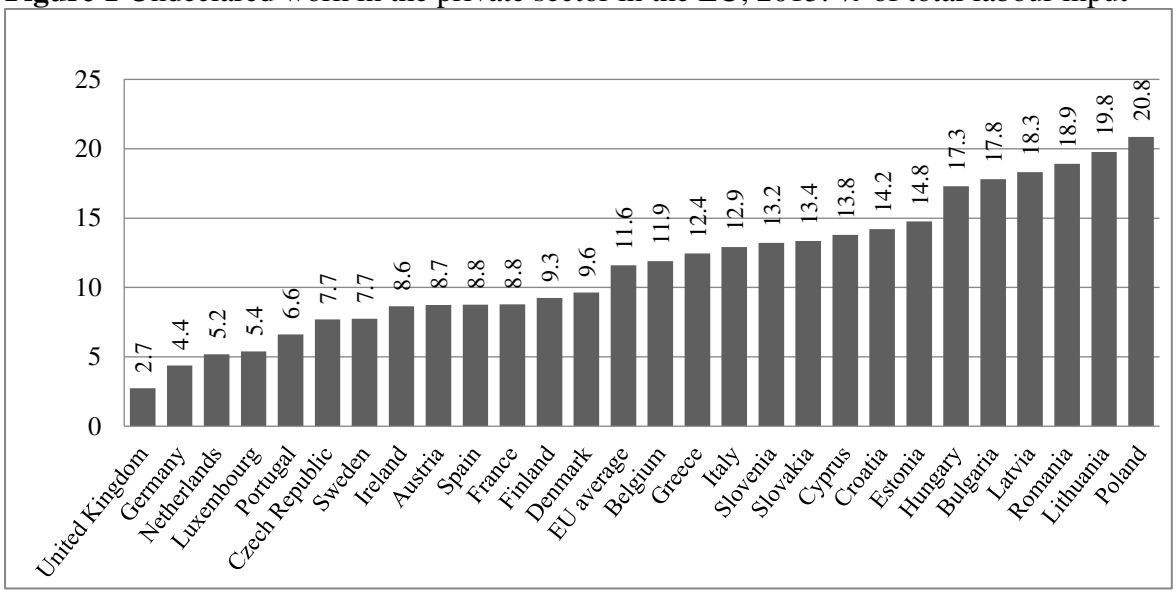
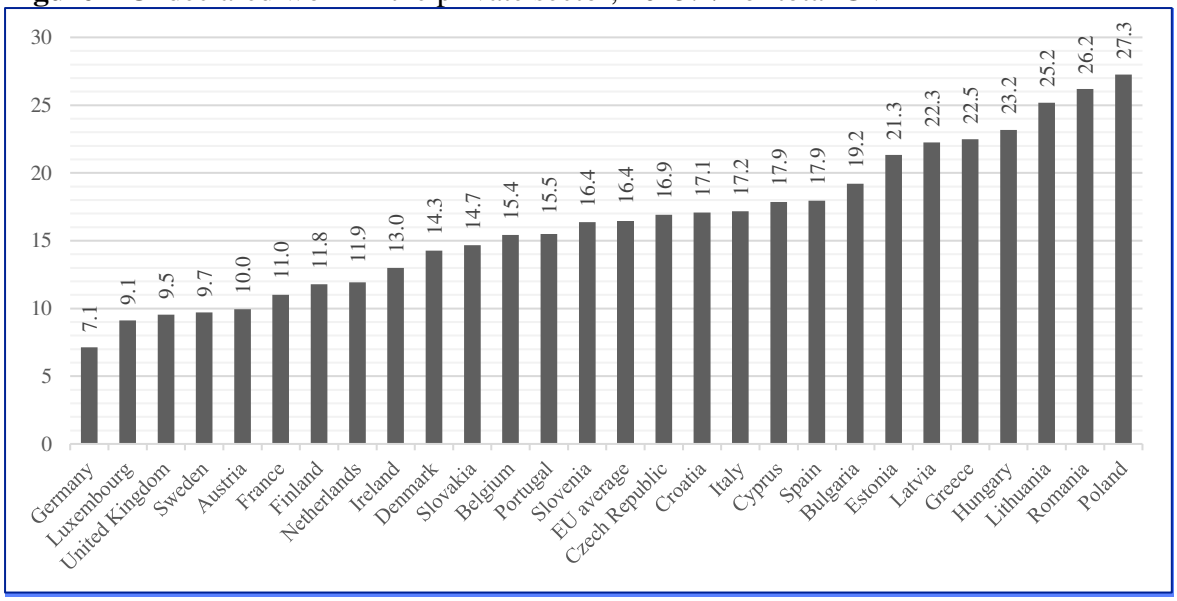
Figure 1 Undeclared work in the private sector in the EU, 2013: % of total labour input



Notes: Estimates for Malta are not provided due to the inadequacy of the data for this member state

Source: derived from Williams *et al*. (2017)

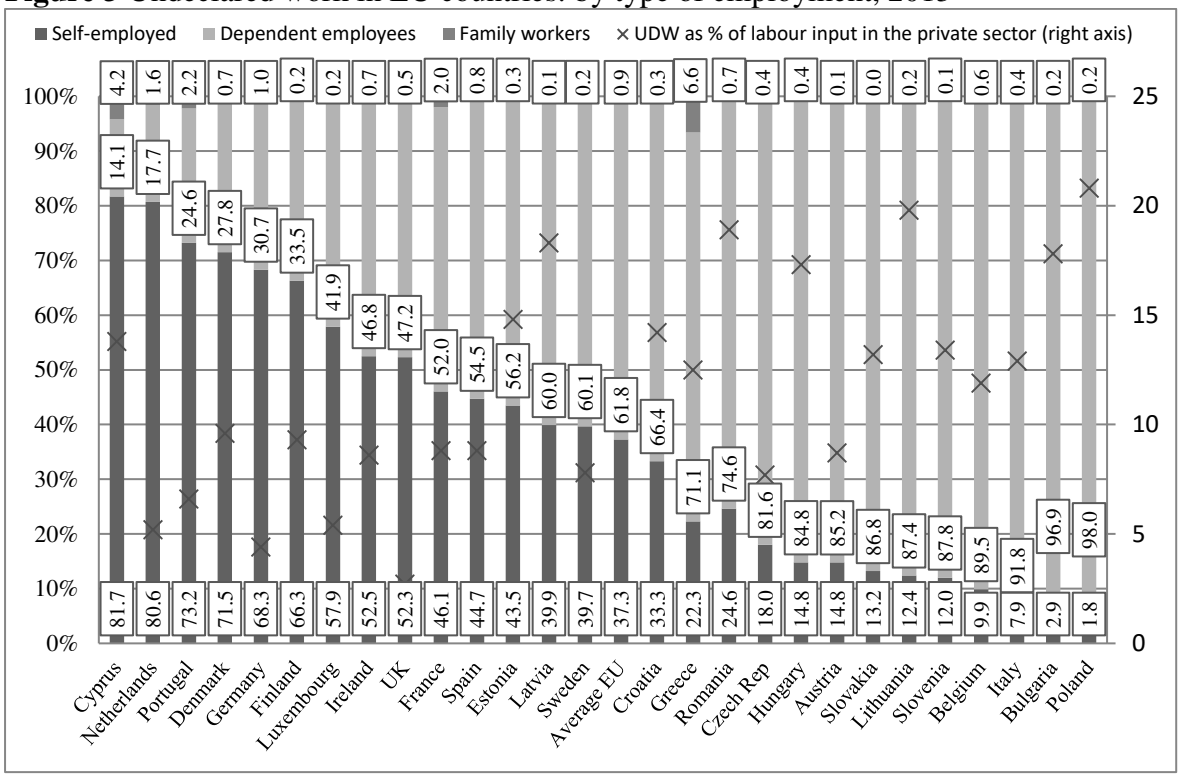
Figure 2 Undeclared work in the private sector, 2013: % of total GVA



Notes: Estimates for Malta are not provided due to deficiencies of data sources for this member state

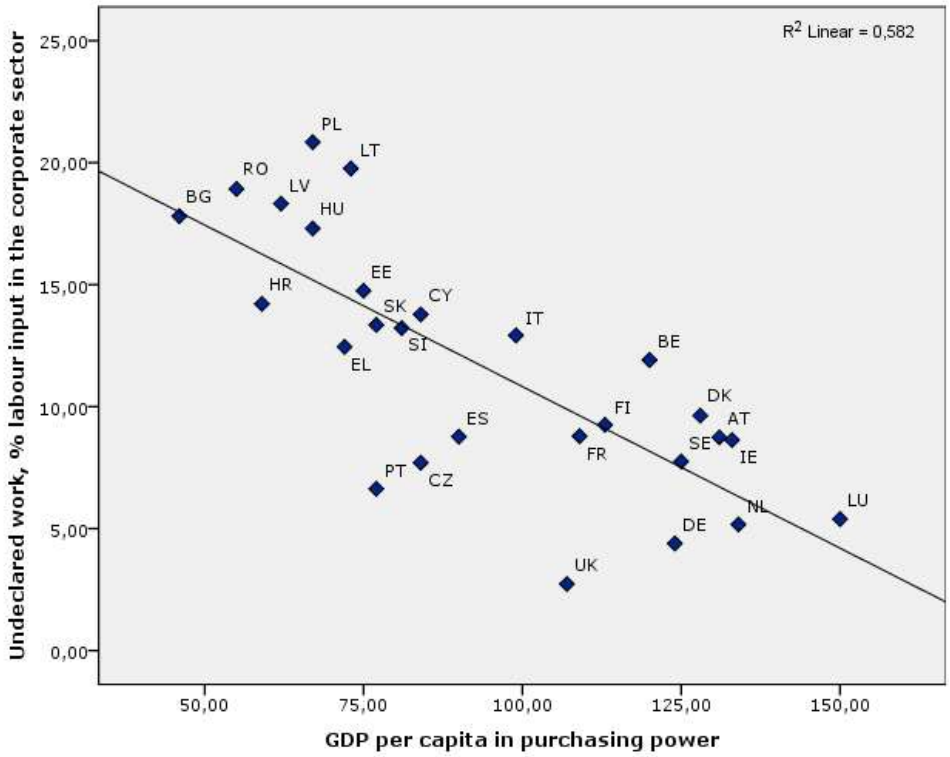
Source: derived from Williams *et al*. (2017)

Figure 3 Undeclared work in EU countries: by type of employment, 2013



Source: derived from Williams *et al*. (2017)

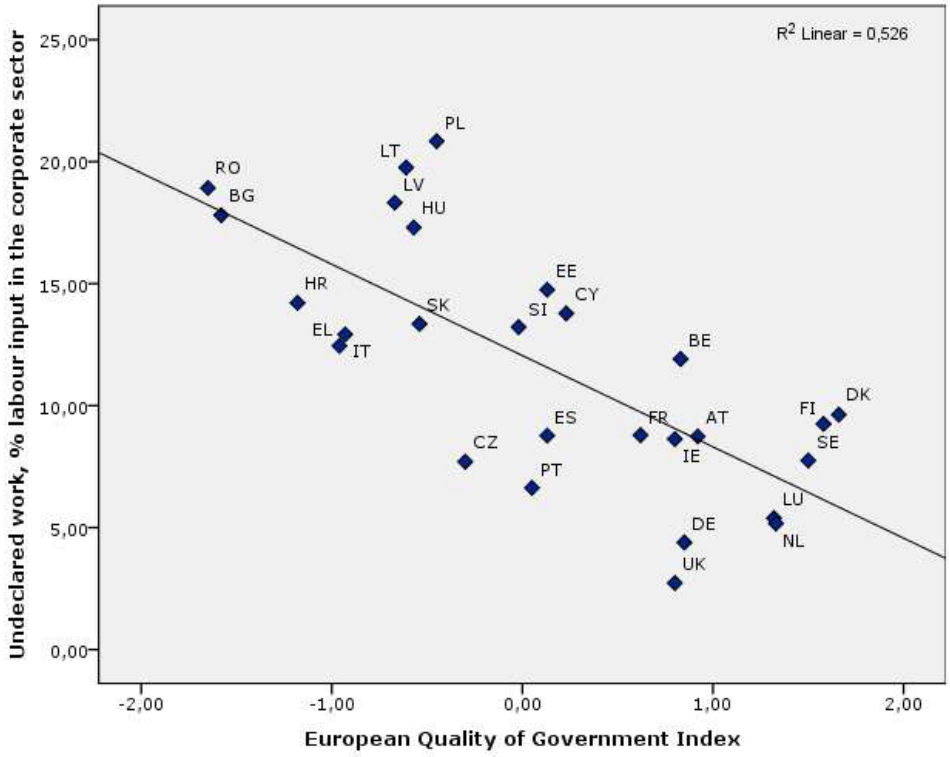
Figure 4. Relationship between undeclared work and GDP per capita, 2013



Note: To avoid excessive influence, the GDP of Luxembourg was capped at 150 in the analyses presented here. It should be noted that using the original figure of 262, the correlation coefficient is the same

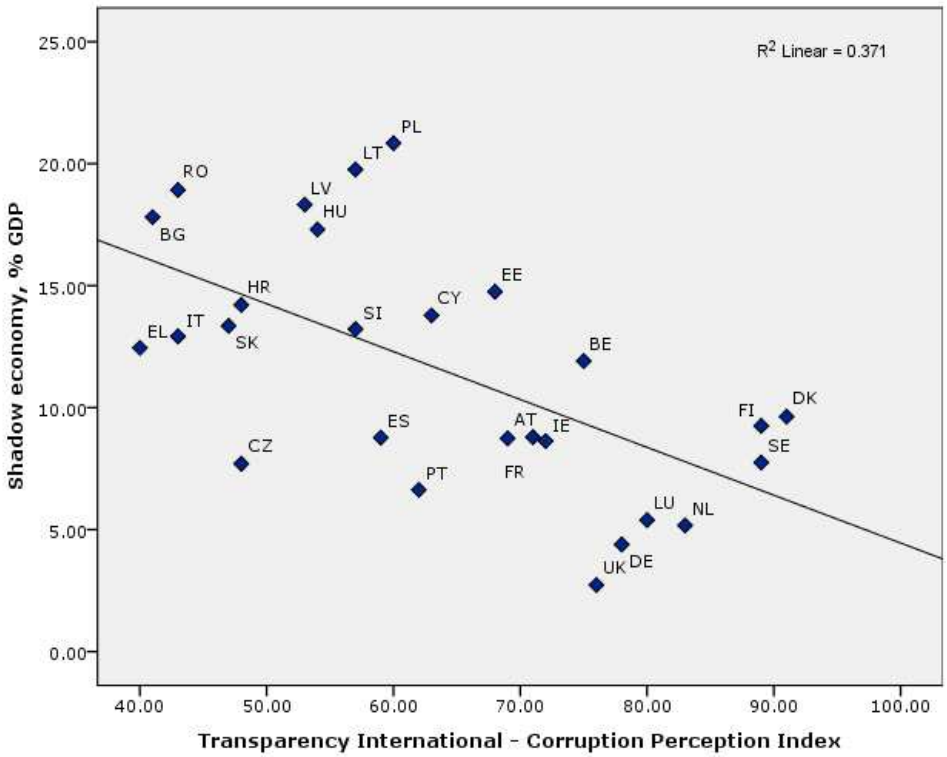
Source: own calculations based on data from Eurostat database

Figure 5. Relationship between undeclared work and European Quality of Government Index, 2013



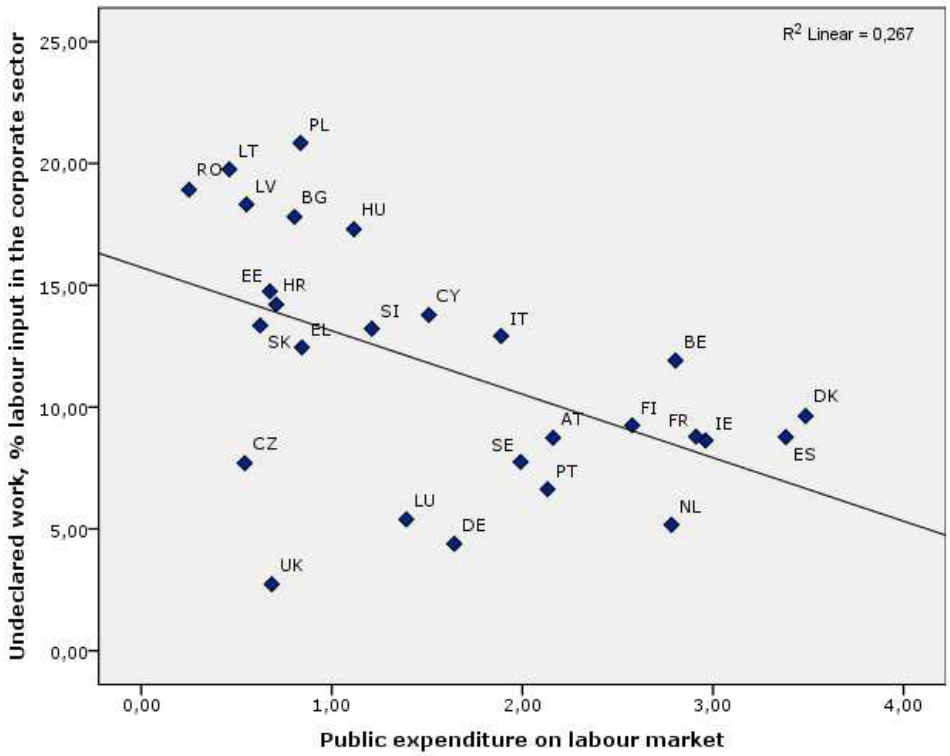
Source: own calculations based on data from Charron *et al.* (2015)

Figure 6. Relationship between undeclared work and Transparency International Corruption Perception Index, 2013



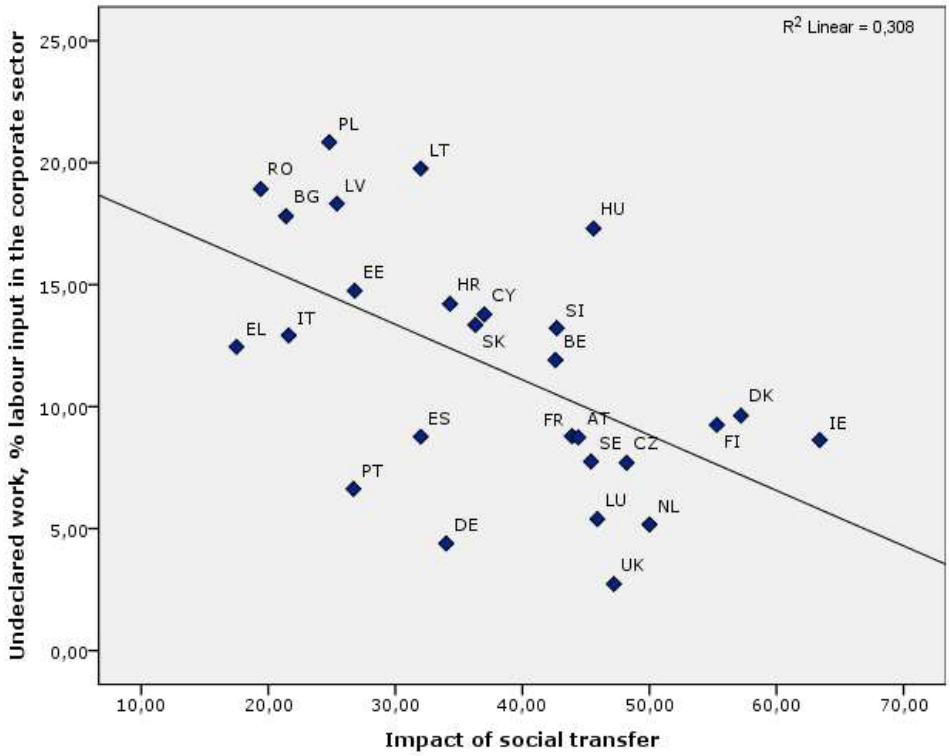
Source: own calculations based on data from Transparency International

Figure 7. Relationship between undeclared work and public expenditure on labour market, 2013



Source: own calculations based on data from Eurostat database

Figure 8. Relationship between undeclared work and impact of social transfers on reducing poverty, 2013



Source: own calculations based on data from European Commission report *Employment and Social Developments in Europe 2015*

Table 1. Undeclared work in EU28: estimates by using differing approaches

	Undeclared work in the private sector		Informal employment in total employment	Shadow Economy
	% of total labour input	% of total GVA	%	MIMIC estimates
	2013	2013	2012/2013*	2013
Austria	8.7	10.0	10.0	8.7
Belgium	11.9	15.4	13.5	18.8
Bulgaria	17.8	19.2	15.9	22.4
Croatia	14.2	17.1	13.0	25.3
Cyprus	13.8	17.9	15.1	34.7
Czech Republic	7.7	16.9	9.2	11.8
Denmark	9.6	14.3	11.2	15.2
Estonia	14.8	21.3	6.9	18.0
Finland	9.3	11.8	6.3	13.1
France	8.8	11.0	9.8	12.4
Germany	4.4	7.1	10.2	9.2
Greece	12.4	22.5	32.8	27.8
Hungary	17.3	23.2	12.2	21.6
Ireland	8.6	13.0	13.5	11.1
Italy	12.9	17.2	19.0	24.5
Latvia	18.3	22.3	13.2	16.7
Lithuania	19.8	25.2	12.6	18.3
Luxembourg	5.4	9.1	1.2	10.7
Malta			8.1	27.2
Netherlands	5.2	11.9	9.4	8.4
Poland	20.8	27.3	38.0	18.9
Portugal	6.6	15.5	12.1	20.4
Romania	18.9	26.2	28.9	24.0
Slovakia	13.4	14.7	16.7	11.8
Slovenia	13.2	16.4	5.0	23.0
Spain	8.8	17.9	27.3	24.4
Sweden	7.7	9.7	8.2	12.3
United Kingdom	2.7	9.5	13.6	9.6

*Notes:** Harmonized data (ILO, 2018) latest available year: 2012; for Germany latest available year is 2013

Sources: derived from Williams et al. (2017), ILO (2018), Medina and Schneider (2018)

Appendix 1 Data sources of the structural conditions

Table A1. Indicators used and description

Indicator/ Year	Description
GDP per capita in purchasing power standards/ 2013	Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. The volume index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union (EU28) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa. Basic figures are expressed in PPS, i.e. a common currency that eliminates the differences in price levels between countries allowing meaningful volume comparisons of GDP between countries. Please note that the index, calculated from PPS figures and expressed with respect to EU28 = 100, is intended for cross-country comparisons rather than for temporal comparisons. *Available at:* http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00114&plugin=1
European Quality of Government Index/ 2013	The European Quality of Government Index (EQI) is the result novel survey data on corruption and governance at the regional level within the EU, conducted in first in 2010 and then again in 2013. The data focus on both perceptions and experiences with public sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality. The data is standardized with a mean of zero, and higher scores implying higher quality of government. *Available at:* https://nicholascharron.wordpress.com/european-quality-of-government-index-eqi/
Corruption Perceptions Index/ 2013	The Corruption Perceptions Index ranks countries and territories based on how corrupt their public sector is perceived to be. A country or territory's score indicates the perceived level of public sector corruption on a scale of 0 - 100, where 0 means that a country is perceived as highly corrupt and 100 means it is perceived as very clean. A country's rank indicates its position relative to the other countries and territories included in the index. This year's index includes 177 countries and territories. *Available at:* https://www.transparency.org/cpi2013/results#myAnchor1
Impact of social transfers on poverty reduction/2013	Poverty defined as the proportion of people with an income below 60% of the national median income. *Available at:* http://ec.europa.eu/social/BlobServlet?docId=14951&langId=en
Public expenditure on	Labour market policy expenditure (% of GDP):

labour market interventions to protect vulnerable groups/ 2013	Labour market policy (LMP) interventions cover the range of financial and practical supports offered by governments to people who are unemployed or otherwise disadvantaged in the labour market. *Available at:* http://ec.europa.eu/eurostat/web/labour-market/labour-market-policy/database
Implicit tax rate (ITR) on labour/ 2012	Implicit tax rate on labour: approximates to the average effective tax burden on labour, and is the sum of all direct and indirect taxes and employees' and employers' social contributions levied on employed labour income divided by the total compensation of employees. *Available at:* http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00119&plugin=1