
Article:
Williams, C.C. and Horodnic, I. (2017) Evaluating the illegal employer practice of under-reporting employees' salaries. British Journal of Industrial Relations, 55 (1). pp. 83-111. ISSN 0007-1080

https://doi.org/10.1111/bjir.12179

10,318 words

Evaluating the illegal employer practice of under-reporting employees' salaries

Abstract

This paper advances understanding of the prevalence and distribution of the illegal employer practice of under-reporting *employees'* salaries, explains this practice and evaluates policy approaches. Analysing a 2013 Eurobarometer survey of 11,025 employees in 28 European countries, one in 33 employees receive under-reported salaries, mostly in small businesses and vulnerable groups (e.g., unskilled workers, with lower education levels and financial difficulties). Explaining this practice not as an individual criminal act that increasing the risk of detection can tackle, but as a symptom of systemic problems, which require improvements both in tax morale at the individual-level and in the formal institutional environment at the country-level to resolve, we then discuss the implications for theory and policy.

Key words: informal economy; informal employment; undeclared economy; envelope wages; tax compliance; tax evasion; European Union

1. Introduction

Understanding illegal labour practices lies at the very heart of the study of industrial relations. Unless the various illegal labour practices pursued by employers to reduce their labour costs are tackled, such as the use of undeclared labour and sub-contracting to the 'bogus self-employed', the result will be a diminution of state control over the quality of working conditions, weakened trade union and collective bargaining and pressure on legitimate

businesses to evade regulatory compliance due to the unfair competition (Andrews et al. 2011; ILO 2014; TUC 2008). To advance understanding of illegal labour practices, this paper evaluates the fraudulent employer practice of under-reporting employees' salaries to the authorities in order to evade their full social insurance and tax liabilities (Chavdarova 2014; Williams 2009; Woolfson 2007). The aim is to analyse the prevalence and distribution of this practice, to explain its existence and explore how to tackle it.

Here, therefore, we advance understanding of illegal wage practices in three ways. From an empirical viewpoint, we report Eurobarometer survey data from 28 member states to determine the prevalence and distribution of salary under-reporting. Secondly, and theoretically, we then explain its prevalence and distribution as a symptom of not only individual-level variables, notably the acceptability of non-compliance, but also systemic problems by documenting the country-level determinants that lead to its greater prevalence. Finally, and from a policy perspective, we show how the currently dominant deterrence approach based on improving detection does not reduce this illegal wage practice. Instead, tackling this illegal wage practice requires a more indirect approach that both changes attitudes towards compliance at the individual-level and resolves specific systemic problems at the country-level that lead to its greater prevalence.

To show this, section 2 briefly reviews the previous literature on the illegal practice of under-reporting formal employees' salaries. The outcome will be a set of hypotheses regarding the association between salary under-reporting and who engages at the individual-level, whether under-development, over-interference or under-intervention by the state causes salary under-reporting and how to tackle this practice. To test these hypotheses, section 3 then reports the data used, namely a 2013 Eurobarometer survey comprising 11,025 face-to-face interviews with formal employees in the 28 member states of the European Union (EU-28), and the analytical methods employed; a staged multi-level logistic regression model utilizing

the hierarchical nature of the data (individuals within countries). Section 4 reports the findings regarding the association between salary under-reporting at both an individual- and country-level and who does it, whether under-development, under- or over-regulation determines the level of salary under-reporting and what needs to be done to reduce it. Section 5 then discusses the theoretical and policy implications of the findings along with the limitations and future research required.

2. Illegal under-reporting of wages

Over the past decade, a small but growing literature has drawn attention to how formal employers often reduce their tax and social security payments and therefore labour costs by paying their formal employees two salaries; an official declared salary and an additional undeclared ('envelope') wage which is hidden from the authorities for tax and social security purposes. The instigation of this illegal labour practice usually occurs at the job interview stage. Alongside the agreement to pay an official declared wage detailed in a formal written contract, the employer at the same time reaches a verbal unwritten agreement with the employee to pay an additional 'envelope wage' not declared to the authorities for tax and social security purposes (Chavdarova 2014; Williams 2009; Woolfson 2007). Salary under-reporting thus arises from fraudulent labour contracts where the conditions in the written contract differ to that verbally agreed. Unless the employee agrees to these conditions, then generally they do not get the job. These conditions include: that the employee will not take their full statutory entitlement to annual leave; that they will work longer hours than in their formal contract (which often means working more than the maximum hours in the working hours directive and/or being paid less than the minimum hourly wage), and/or that they will have a different tasks and responsibilities to that specified in their formal contract (Williams 2014a). This verbal contract supersedes the formal written contract of employment in that it

constitutes the unwritten 'psychological contract' regarding their conditions of employment (Rousseau 1995). Although verbal agreements in many countries are legal and hold the same weight in law as a written contract, this particular verbal contract to under-report salaries is illegal because it fraudulently under-reports the wage earned by the employee in order to evade the full tax and social security payments owed by the employee and employer.

Prevalence and distribution of salary under-reporting

Currently, little evidence exists on the prevalence and distribution of this illegal wage practice due to the small-scale qualitative nature of previous studies, conducted largely in East-Central European nations such as Bulgaria (Chavdarova 2014), Estonia (Meriküll and Staehr 2010), Latvia (Kukk and Staehr 2014; Meriküll and Staehr 2010; OECD 2003; Putniņš and Sauka 2015; Sedlenieks 2003), Lithuania (Meriküll and Staehr 2010; Sasunkevich 2014; Woolfson 2007), Romania (Neef 2002), Russia (Kapelyushnikov et al. 2012; Williams and Round 2007) and Ukraine (Round et al. 2008; Williams 2007). For instance, in Lithuania, Woolfson (2007) provides an in-depth case study of one person, albeit a cause celebre, whilst Sedlenieks (2003) in Latvia reports 15 face-to-face interviews conducted in Riga. Meanwhile, Williams (2007) in Ukraine interviews 600 households but only in three localities, whilst Williams and Round (2007) in Russia interview 313 households but only in three districts of Moscow. These studies, therefore, cannot document its prevalence and distribution.

Nevertheless, they do provide clues to the extensiveness of this practice. For example, in Ukraine, 30 per cent of formal employees reported receiving an envelope wage from their formal employer (Williams 2007) and 65 per cent in Moscow (Williams and Round 2007). A survey repeated in 1998 and 2002 involving 900 interviews similarly reveals that 19.5 per cent of employees received envelope wages in 1998 and 9.6 per cent in 2002 in Estonia, 16.3 per cent and 22.5 per cent respectively in Latvia and 7.2 per cent and 11.7 per cent in

Lithuania (Meriküll and Staehr 2010). However, these studies undertaken in post-socialist societies at the height of the transition process do not reflect the current position in East-Central Europe and beyond.

Which employee groups receive envelope wages and which businesses are more likely to pay such wages? Synthesising the qualitative data and vignettes of individuals receiving such envelope wages in the small-scale qualitative and/or locality studies provides some clues. They view this as an employer- rather than employee-instigated wage practice (Round et al. 2008), concentrated amongst small business owners (Sasunkevich 2014) and largely vulnerable groups of employees, such as younger age groups amongst whom unemployment is high, lower-income employees, unskilled manual workers, and often women rather than men (Chavdarova 2014; Sedlenieks 2003). Similar findings result from the descriptive findings of the relatively larger, mostly country-level, studies which identify that younger persons and the lower paid are more likely to receive envelope wages and smaller rather than larger firms to engage in this illegal practice (Williams 2007; Williams and Round 2007; Williams and Padmore 2013). Based on these tentative findings therefore, we here test the following propositions:

H1a: Women are more likely to receive envelope wages than men.

H1b: Those with financial difficulties are more likely to receive envelope wages than those without financial difficulties.

H1c: Younger age groups are more likely to receive envelope wages than older age groups.

H1d: Unskilled manual workers are more likely to receive envelope wages than more skilled and professional workers.

H1e: Workers with fewer years in formal education are more likely to receive envelope wages than those who spent longer in formal education.

H1f: Smaller businesses are more likely to under-report salaries than larger firms.

Explaining salary under-reporting

Most studies simply describe the prevalence and character of this illegal wage practice. In the only previous study to seek explanations for this practice, Williams (2014b) draws upon three theories of the wider undeclared economy to understand salary under-reporting.

Firstly, the 'modernisation' thesis explains the undeclared economy as a leftover from a pre-modern mode of production and as becoming less prevalent with economic development and modernisation (Lewis 1959; La Porta and Schleifer 2014). From this viewpoint, therefore, the prevalence of salary under-reporting will be greater in less developed economies, measured in terms of GNP per capita, and societies lacking modern state bureaucracies.

Secondly, a group of mostly neo-liberal scholars adopt a 'state over-interference' thesis. This explains undeclared work as resulting from a rational economic decision to voluntarily exit the declared realm due to high taxes and state interference in the free market which increases the cost, time and effort associated with formal employment (e.g., De Soto 1989, 2001; London and Hart 2004; Nwabuzor 2005; Sauvy 1984). Viewed in this manner, salary under-reporting will be more prevalent in countries with higher taxes, greater state interference in the labour market and higher social transfers, and reductions in taxation and state interference the solution.

Third and finally, a 'state under-intervention' thesis conversely purports that the undeclared economy results from inadequate levels of state intervention in work and welfare, which leaves workers less than fully safeguarded and dependent on the undeclared economy as a survival strategy (Slavnic 2010; Taiwo 2013). Seen through this lens, salary under-

reporting will result from inadequate levels of state intervention in the labour market and lower social transfers and the focus therefore should be upon increasing social transfers to reduce inequality and deprivation, and pursuing labour market interventions to help vulnerable groups (Davis 2006; Gallin 2001; ILO 2014). This illegal wage arrangement will be thus more prevalent in countries with higher levels of deprivation, less labour market intervention and less redistribution via social transfers.

Until now, these competing explanations have only been evaluated using simple bivariate correlations between cross-national variations in envelope wages and cross-national variations in country-level variables (e.g., tax rates) that reflect the various tenets of these competing perspectives (Williams 2010, 2014b). These bivariate descriptive analyses reveal support for the modernisation and state under-intervention theses but no support for the state over-interference thesis. This simplistic analytical method however, fails to analyse whether these associations remain significant when holding other variables constant, including the individual-level variables above discussed. To evaluate this, we here use multi-level logistic regression analysis using the hierarchical nature of the data (individuals within countries) to test the validity of the following explanations for this illegal labour practice:

Modernisation hypotheses

H2: the likelihood of under-reporting wages is lower in more modernised economies

H2a: the likelihood of under-reporting wages is lower in wealthier economies.

H2b: the likelihood of under-reporting wages is lower in societies with modern state bureaucracies.

State over-interference hypotheses

H3: the likelihood of under-reporting wages is lower in economies with lower state-interference.

H3a: the likelihood of under-reporting wages is lower in economies with lower tax rates.

H3b: the likelihood of under-reporting wages is lower in economies with lower levels of expenditure on labour market interventions to protect vulnerable groups

H3c: the likelihood of under-reporting wages is lower in economies with lower levels of redistribution via social transfers to protect workers from poverty.

State under-intervention hypotheses

H4: the likelihood of under-reporting wages is lower in economies with higher levels of state-intervention in work and welfare.

H4a: the likelihood of under-reporting wages is lower in countries with higher levels of severe material deprivation.

H4b: the likelihood of under-reporting wages is lower in more equal societies.

H4c: the likelihood of under-reporting wages is lower in economies with greater levels of expenditure on labour market interventions to protect vulnerable groups.

H4d: the likelihood of under-reporting wages is lower in economies with more effective policies of redistribution via social transfers to protect workers from poverty.

Policy approaches towards salary under-reporting

Conventionally, drawing upon the Allingham and Sandmo (1972) rational economic actor model, when the pay-off from evasion is greater than the expected cost of being caught and punished, the result is salary under-reporting. To tackle non-compliance, most governments have thus concentrated on the cost side of the equation by increasing for example the actual and/or perceived likelihood of detection using workplace inspections and data sharing and

matching to identify discrepancies in wage rates in particular businesses relative to the average in the sector (e.g., Hasseldine and Li 1999; Williams 2014a).

However, no conclusive evidence exists that this approach is effective. Although some argue that increasing the probability of audit and detection reduces non-compliance, at least for some income groups (Klepper and Nagin 1989; Varma and Doob 1998), others reveal that it leads to increased non-compliance, not least due to a breakdown of trust between the state and its citizens (Chang and Lai 2004; Kirchler et al. 2014). Indeed, the perhaps most telling rebuttal of the rational actor model is that many voluntarily comply even when the risks of detection compared with the benefits of being compliant warrant them acting in a non-compliant manner (Murphy 2008).

In recent years, therefore, a 'social actor' model has emerged in the form of a 'tax morale' approach, which views non-compliance as arising when the intrinsic motivation to pay taxes is low. The consequent goal is to elicit greater voluntary commitment to compliant behaviour (Alm and Torgler 2011; Kirchler 2007; Torgler 2012). Rather than seek compliance via close supervision and monitoring, tight rules, prescribed procedures and centralised structures within the context of a low commitment, low trust and adversarial culture, a high trust, high commitment culture is pursued that aligns the values of employers and employees with the formal rules so as to generate internal control. This, therefore, seeks to change the norms, values and beliefs of citizens regarding compliance by improving tax knowledge, using awareness raising campaigns about the costs of non-compliance and benefits of compliance, and/or normative appeals.

However, low tax morale is also symptomatic of the existence of 'weak' formal institutions. Changes in formal institutions are thus also sought. These are of two varieties. Firstly, changes in the processes of formal institutions are advocated through the promotion of tax fairness, procedural justice and redistributive justice (Murphy 2005) and secondly, wider

economic and social developments, akin to those in hypotheses 2-4 above, based on the belief that this illegal wage practice is a symptom of systemic problems related to the formal institutional environment. Here, therefore, we test the validity of the following hypotheses that, when combined with H2-4, reflect the contrasting ways of tackling this illegal wage practice:

Detection hypothesis (H5a): salary under-reporting will be lower amongst those viewing the risk of detection as higher.

Attitudes towards tax compliance hypothesis (H5b): salary under-reporting will be lower when there is higher tax morale.

3. Methodology: data, variables and analytical methods

Data

We here report the results of special Eurobarometer survey no. 402, which involved 27,563 face-to-face interviews conducted in April and May 2013 across the EU-28. This interviewed adults aged 15 years and older in the national language based on a multi-stage random (probability) sampling methodology, with the number of interviews varying from 500 in smaller countries to 1,500 in larger nations. The methodology ensures that on the issues of gender, age, region and locality size, each country as well as each level of sample is representative in proportion to its population size. Therefore, for the univariate analysis we employed sample weighting, as recommended in both the wider literature (Solon et al. 2013; Winship and Radbill 1994) and the Eurobarometer methodology, to obtain meaningful descriptive results. For the multivariate analysis however, debate exists over whether a

weighting scheme should be used (Pfefferman 1994; Solon et al. 2013; Winship and Radbill 1994). Reflecting the dominant viewpoint, we decided not to use the weighting scheme.

The face-to-face interviews covered attitudes towards undeclared work, followed by questions on purchasing undeclared goods and services, envelope wages and finally supplying undeclared work. Here, we confine discussion to the questions on envelope wages. This examined, firstly, whether formal employees had received an undeclared (envelope) wage in addition to their official declared wage from their employer in the prior 12 months, secondly, whether this envelope wage was for their regular work, as payment for overtime hours, or for both and, thirdly, the additional undeclared wage as a percentage of their gross annual wage.

Variables

To analyse the above hypotheses, the dependent variable is whether employees received under-reported wages based on the question 'Sometimes employers prefer to pay all or part of the salary or the remuneration (for extra work, overtime hours or the part above a legal minimum) in cash and without declaring it to tax or social security authorities. Has your employer paid you any of your income in the last 12 months in this way?'.

To analyse the hypotheses regarding the prevalence and distribution of salary under-reporting across employee groups and business types, the following individual-level variables are analysed to test H1a-f respectively:

- Gender: a dummy variable with value one for men and zero for women.
- Difficulties paying bills: a categorical variable for the difficulties in paying bills with value one for having difficulties most of the time, value two for occasionally, and value three for almost never/ never.
- Age: a numerical variable for the exact age of the respondent.

- Occupation: a categorical variable grouping employed respondents by their occupation with value one for those in an employed position at a desk, value two for employed professions, value three for general middle management, value four for those in an employed position, travelling, value five for those in an employed position in a service job, value six for supervisors, value seven for skilled manual workers and value eight for unskilled manaul workers, etc.
- Age formal education ended: a categorical variable for age they stopped full time education with value one for 15 years old and under, value two for 16-19 years old, and value three for 20 years old or over.
- Firm size: a categorical variable for the number of people that respondent's employer employs with value one for firms with one to four people, value two for firms with five to nine people, value three for firms with ten to 19 people, value four for firms with 20 to 49 people, value five for firms with 50 to 99 people, value six for firms with 100 to 499 people and value seven for firms with 500 or more than 500 people.

To analyse hypotheses H2-4, we evaluate the association between cross-national variations in salary under-reporting and the country-level variables considered important in each explanation. We use the same country-level variables as the previous simplistic bivariate analyses of the prevalence of the undeclared economy (Eurofound 2013; Vanderseypen et al. 2013; Williams 2013) and salary under-reporting (Williams 2014b). To evaluate the modernisation hypotheses H2a and H2b respectively, the respective indicators used are:

- GDP per capita in purchasing power standards (Eurostat 2014a), and
- European Quality of Government Index – this includes 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 index is standardized with a mean of zero, with higher scores marking a higher quality of government (Charron et al. 2014).

To evaluate the 'state over-interference' hypotheses (H3) meanwhile, the two indicators used to test the tax rate hypothesis (H3a) are:

- Implicit tax rate (ITR) on labour, which 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 (Eurostat 2014b); and
- Current taxes on income, wealth, etc, which covers all compulsory, unrequited payments, in cash or in kind, levied periodically by general government and by the rest of the world on the income and wealth of institutional units, and some periodic taxes assessed neither on income nor wealth (Eurostat 2014c).

To evaluate the state over-interference in the labour market hypothesis (H3b) and the opposite state under-intervention in the labour market hypothesis (H4c), meanwhile, we analyse:

- Public expenditure on labour market interventions aimed at correcting disequilibria. This covers all public interventions in the labour market aimed at reaching its efficient functioning and correcting disequilibria (e.g., training, employment incentives, supported employment and rehabilitation, out-of-work income maintenance) which explicitly target groups with difficulties in the labour market, namely: the unemployed; those employed but at risk of involuntary job loss; and people who are currently inactive in the labour market but would like to work (Eurostat 2014f).

To evaluate the state over-interference in poverty reduction hypothesis (H3c) and the state under-intervention in poverty reduction hypothesis (H4d), meanwhile, we analyse:

- The impact of social transfers on reducing poverty, with poverty defined as the proportion of people with an income below 60 percent of the national median income.

This computed indicator is based on the formula, 100*(B-A)/B, where B=the proportion at-risk of poverty before social transfers excluding pensions (i.e., the share of people with an equivalised disposable income before social transfers below the at-risk-of-poverty threshold), and A= the proportion at risk-of-poverty after social transfers (i.e., the share of people with an equivalised disposable income after social transfers below the at-risk-of-poverty threshold) (European Commission 2013).

Finally, and to evaluate the two under-interventionist hypotheses that salary under-reporting is related to the level of inequality (H4a) and poverty (H4b), which result in vulnerable populations having to turn to such practices as a survival strategy, we analyse respectively the following two variables:

- The level of income inequality, measured using the income quintile share ratio S80/S20, which is the ratio of total income received by the 20 per cent of the population with the highest income (the top quintile) to that received by the 20 per cent of the population with the lowest income (the bottom quintile) (Eurostat 2014e);
- The level of severe material deprivation, measured by the percentage of the population unable to afford at least four items on a list of nine items considered by most people to be desirable or even necessary to lead an adequate life (Eurostat 2014d);

Given the strong correlation between these eight country-level variables (see Table A1), we first computed an overall index for each of the three competing explanations of salary under-reporting and secondly, for a deeper investigation, we treated each indicator in separate models, providing alternative perspectives on the reasons for salary under-reporting. To produce the overall index for each of the three explanations, we here used the min-max normalization method for constructing composite indicators (OECD 2008). This consists of assigning values between 0 (laggard) and 1 (leader) to each country-level variable and then aggregating them using equal weighting.

Finally, to evaluate the hypotheses (H5a, H5b) regarding the ways of tackling salary under-reporting, the respective indicators analysed are:

- perceived risk of detection, a categorical variable measuring the risk of being detected with recoded value one for very small, value two for fairly small, value three for fairly high and value four for very high;
- attitudes towards non-compliance, measured using an interval variable based on employees' rating the acceptability of six forms of non-compliance using a 10-point Likert scale (1 equals absolutely unacceptable and 10 equals absolutely acceptable). These are: someone receives welfare payments without entitlement; a firm is hired by another firm and does not report earnings; a firm hires a private person and all or part of their salary is not declared; a firm is hired by a household and does not report earnings; someone evades taxes by not or only partially declaring income; and a person hired by a household does not declare earnings when it should be declared. The index for each individual, group and nation is calculated using the mean score across these six attitudinal questions. Lower values represent higher tax morale, and vice versa.

Analytical methods

To evaluate the prevalence and distribution of salary under-reporting across employee groups and business types (hypotheses H1), we conduct a logistic regression analysis across the individual-level variables. The hypotheses (H2-4) investigating the country-level variables associated with a higher propensity to under-report salaries are tested by staged multi-level logistic regression analysis. This utilizes the hierarchical nature of the data (individuals within countries) by firstly examining the individual-level variables and then integrating each country-level independent variable in turn to analyse their association with a higher

propensity to under-report salaries. To evaluate the validity of using various policy measures to tackle salary under-reporting (hypotheses H5) similarly, we investigate attitudes towards these policy measures to analyse whether they are significantly associated with a lower propensity to receive under-reported salaries, whilst holding constant the other variables. Below, we report the results.

4. Descriptive findings

Of the 27,563 face-to-face interviews conducted during 2013 across the EU-28, some 11,025 respondents (42 per cent) were formal employees. Of these, one in 33 (3 per cent) had received part of their salary from their employer as an undeclared ('envelope') wage in the year prior to the survey. Extrapolating from this, 6.36 million of the 212 million employees in the EU-28 receive under-reported salaries and on average, 25 per cent of their gross annual income in this manner.

Variations across businesses and employee groups

As Table 1 displays, the distribution of salary under-reporting is uneven across business types and employee groups. Although this illegal labour practice prevails in all sizes of firm, occupations and socio-demographic groups, it is more common in some. Smaller firms are more likely to fraudulently under-report salaries, with 5 per cent of formal employees in businesses with less than 20 employees receiving envelope wages compared with 1 per cent of employees in businesses employing 50 employees or over. This in part may be a result of the relative absence of dedicated HRM staff and formal HRM practices in smaller businesses (Barrett and Mayson 2007; Benmore and Palmer 1996), meaning that employers are more able to introduce unwritten verbal contracts that contravene the employees' formal written contract.

Salary under-reporting is also more prevalent amongst some employee groups. Manual workers are more likely to receive envelope wages; 7 per cent of unskilled and 5 per cent of skilled manual workers. So too are younger people, amongst whom joblessness is much higher (European Commission 2013), although those of retirement age are also more likely, as are those with less years in formal education and those having difficulties paying the household bills most of the time. Therefore, the tentative picture is that salary under-reporting is more prevalent amongst vulnerable employees.

INSERT TABLE 1 HERE

Cross-national variations in the under-reporting of wages

It is similarly the case that the prevalence of wage under-reporting is uneven across nations and EU regions. As Table 2 displays, in East-Central Europe 6 per cent of formal employees receive envelope wages, compared with 4 per cent in Southern Europe and just 1 per cent in Western Europe and Nordic countries. Given that East-Central Europe is the abode of just 22 per cent of the formal employees surveyed, but 45 per cent of those receiving envelope wages, this wage practice is therefore heavily concentrated in East-Central European nations.

INSERT TABLE 2 HERE

It is not equally prevalent however, across all East-Central European nations. In Latvia, 11 per cent of formal employees receive envelope wages, 7 per cent in Romania, 5 per cent in the Czech Republic, Estonia and Poland respectively and 4 per cent in Slovenia. Other nations beyond East-Central Europe having above EU-average rates include Greece (7 per cent), Spain (5 per cent) and Belgium (4 per cent).

5. Analysis

To evaluate firstly, whether the variations across business types and employee groups are significant when other characteristics are taken into account and held constant (H1), secondly, the validity of the contrasting explanations for the cross-national variations in salary under-reporting (H2-4), and thirdly, the policy approaches (H5), we here report the results of a staged multi-level logistic regression model. This utilizes the hierarchical nature of the data (individuals within countries).

The first stage in the analysis estimated a baseline random intercept model with no explanatory variables to identify the appropriateness of a multi-level approach. This analysis indicated that over 13 per cent of the variance in salary under-reporting is accounted for at the country level (Wald = 8.469, df=1, $p<0.01$), indicating significant variation between countries in the prevalence of envelope wage payments. Given this justification for using multilevel mixed-effects logistic regression analysis, the second stage involved constructing a model with first-level (i.e. individual-level) variables to understand their effect. The third stage then included both first- and second-level (i.e. country-level) variables to understand the effects at both levels.

INSERT TABLE 3 ABOUT HERE

Model 1 in Table 3 reports which business types and employee groups are more likely to receive under-reported salaries when taking into account and holding constant other characteristics. This reveals the uneven distribution of salary under-reporting. Smaller firms are significantly more likely to under-report wages (confirming H1f) and unskilled and skilled manual workers, and those who travel for their jobs more likely to receive envelope wages than those in employed positions at a desk (confirming H1d). This displays that employers

target vulnerable groups. Compared with an employed position at a desk, being an unskilled and skilled manual worker increases the log odds of receiving envelope wages by 0.556 and 0.674 respectively. Compared with an employed position at a desk, travelling for a job increases the log odds of receiving envelope wages by 0.805, doubtless due to working longer hours than their formal written contract stipulates. Men are also significantly more likely to receive under-reported salaries than women (refuting H1a), as are younger employees (confirming H1c), those who have difficulties most of the time in paying their household bills (confirming H1b) and those with fewer years in education (confirming H1c). Receiving under-reported salaries is thus more likely among vulnerable population groups, perhaps reflecting how employers target such groups.

Models 2-4 in Table 3 meanwhile, test hypotheses H2-4 regarding how to explain the cross-national variations in salary under-reporting. Firstly, however, we must determine whether significant cross-national variations exist in the propensity to under-report salaries after controlling for the individual-level variables. Figure 1 displays the residual country effects. A country whose confidence interval does not overlap the line at zero differs significantly from the EU-28 average at the 5 per cent significance level. At the lower end, Germany and Italy have a significantly lower propensity to under-report salaries. At the upper end, Romania, Latvia, Croatia and Bulgaria have a significantly higher propensity to under-report salaries. Given these significant cross-national variations in the propensity to under-report salaries when the individual-level variables are included, we can here evaluate the various competing explanations.

INSERT FIGURE 1 HERE

Eight country-level variables evaluate the various tenets of the three competing explanations for the cross-national variations in salary under-reporting. Given that these eight country-level variables are strongly correlated (see Table A1), we first compute an overall index for each of the three competing explanations of salary under-reporting and secondly, for a deeper investigation, treat each indicator in separate models, providing alternative perspectives on the reasons for salary under-reporting.

Starting with the modernisation thesis, model 2 reveals a significant relationship between salary under-reporting and the modernisation index (confirming H2). Breaking this down, model 2a in Table 3 provides evidence that an employee in countries with lower levels of GDP per capita is more likely to engage in salary under-reporting (confirming H2a). For a one unit increase in GDP per capita, the log odds of receiving envelope wages decreases by 0.014. Model 2b reveals that salary under-reporting is higher among employees living in countries with lower qualities of government (confirming H2b). For a unit increase in the European Quality of Governance Index, the log odds of receiving envelope wages decreases by 0.350. These models therefore support the modernisation thesis (H2) that in countries with lower levels of economic development and less modernised state bureaucracies, salary under-reporting is more prevalent.

To evaluate the state over-interference thesis (H3), model 3 reveals no significant relationship between salary under-reporting and the state over-interference index (refuting H3). Breaking this down, model 3a shows that the implicit tax rate on labour has no significant association with salary under-reporting (refuting H3a), whilst model 3b reveals a significant association between salary under-reporting and current taxes but in the opposite direction proposed by H3a. Salary under-reporting is more common among employees living in countries with lower tax levels (again refuting H3a).

Evaluating the state under-intervention hypothesis (H4), model 4 displays a significant association between salary under-reporting and the state under-intervention index (confirming H4). Breaking this down, Model 4a reveals salary under-reporting to be more likely among employees in countries with higher rates of severe material deprivation (confirming H4a) and model 4b that salary under-reporting is more likely among employees in countries with higher income inequalities (confirming H4b). Evaluating whether various forms of state intervention reduce salary under-reporting, model 4c displays that salary under-reporting is more likely among employees in countries with smaller levels of public expenditure on labour market interventions to protect vulnerable groups in the labour market (confirming H4c and refuting H3c). Meanwhile, model 4d displays that salary under-reporting is more likely among employees in countries where social transfers are of a level that they reduce poverty (confirming H4d and refuting H3s). Importantly moreover, the inclusion of all these country-level variables reduces country-level variance. Yet, there remains an amount of unexplained between-countries variance in salary under-reporting.

Turning to hypotheses H5 regarding how to tackle salary under-reporting, all the models in Table 3 reveal no association between the perceived risk of detection and salary under-reporting when other variables are held constant (refuting H5a). Increasing the risk of detection seems not to influence participation. However, across all models, a significant association exists between salary under-reporting and attitudes towards compliance, whichever other characteristics are taken into account and held constant (confirming H5b). A unit decrease in tax morale increases the log odds of receiving envelope wages by 0.286. This suggests that changing attitudes towards compliance influences the level of salary under-reporting.

6. Discussion and Conclusions

In 2013 in the EU-28, 1 in 33 formal employees surveyed report receiving an undeclared ('envelope') wage from their employer in the prior 12 months amounting on average to 25 per cent of their gross income. Although ubiquitous across all business types, employee groups and countries, salary under-reporting is more prevalent in small businesses and vulnerable population groups, including unskilled and skilled manual workers, younger age groups, those who have difficulties paying their household bills and with fewer years in education. It is also concentrated in countries with lower levels of economic development and less modernised state bureaucracies, greater income inequality, higher rates of severe material deprivation, less effective redistribution via social transfers and lower levels of labour market interventions to protect vulnerable groups in the labour market.

Conventionally, tackling this illegal labour practice has involved viewing participants as rational economic actors, and increasing the actual and perceived risks of detection. The above analysis, however, reveals that perceiving the risk of detection as higher does not influence whether one accepts an under-reported salary. Salary under-reporting is nevertheless significantly associated with attitudes towards non-compliance. Those with higher tax morale are less likely to collude with employers than those with lower tax morale. To reduce salary under-reporting therefore, the conventional approach of improving detection appears not to be effective. Instead, measures are required to alter attitudes towards compliance.

Three policy measures can improve attitudes towards compliance. Firstly, to educate employers and employees about the value of taxation so as to elicit an intrinsic motivation to comply, information can be provided on the public goods and services paid for by their taxes (Saeed and Shah 2011). Secondly, it requires advertising campaigns about the benefits of full salary declaration. These can either inform: employees of the costs and risks of under-reporting salaries; employers of the risks and costs; employees of the benefits of fully declaring salaries, and/or employers of the benefits of fully declaring labour. Third and

finally, it requires normative appeals to employers and employees, which for example in Estonia during 2008 resulted in 46 per cent of enterprises adjusting their wage levels and paying more taxes (Lill and Nurmela 2009).

Addressing attitudes towards non-compliance, however, is necessary but insufficient to reduce salary under-reporting. As the country-level variables display, the formal institutional environment also requires reform. On the one hand, and as model 2 in Table 3 reveals, this necessitates improvements in the quality of government, including procedural justice, which refers to whether employers and employees believe that the tax authority treat then in a respectful, impartial and responsible manner (Murphy 2005), procedural fairness, which is the extent to which employers and employees believe they are paying their fair share compared with others (Molero and Pujol 2012; Wenzel 2006), and redistributive justice, which refers to whether employers and employees believe they receive the goods and services they deserve given the taxes that they pay (Kirchgässner 2010). On the other hand, and as models 3-4 in Table 3 more widely display, governments also need to pursue the achievement of lower levels of severe material deprivation, higher income equality, greater redistribution via social transfers, and higher state intervention in the labour market to protect vulnerable groups.

The theoretical implication, therefore, is not only that the modernisation and state under-intervention theses need synthesising when explaining this illegal labour practice, but also perhaps that the validity of explaining fraudulent salary under-reporting through an institutional theoretical lens requires exploration (Baumol and Blinder 2008; North 1990). Conventionally, this institutional approach is associated with rational choice theory. Here, however, we argue that institutional theory can also support a social actor explanation. Institutional theory views all societies as having codified laws and regulations (i.e., formal institutions) that define the legal rules of the game and informal institutions that are socially

shared unwritten rules (Helmke and Levitsky 2004). This, we contend, can provide a useful theoretical lens for explaining salary under-reporting from a social actor perspective as arising when the informal institutions are unaligned with the formal institutions. Viewed through this institutionalist lens, tax morale measures the degree of asymmetry between individual attitudes towards tax compliance ('civic morality') and the formal rules ('state morality'). The greater the asymmetry between civic and state morality, the greater will be the prevalence of salary under-reporting. Future research could therefore more fully evaluate such an institutionalist asymmetry explanation of salary under-reporting and more widely explore how institutional theory can provide a heuristic framework for supporting a social actor perspective, rather than viewing it solely as supporting a rational choice approach.

There are also other limitations of this study and caveats required. Currently, there remains poor understanding of firstly, the extra conditions imposed on employees in these informal unwritten contracts, secondly, the power relations involved in these agreements to pay under-reported salaries (e.g., whether they are always employer-instigated and imposed on employees), and thirdly, their effects on the quality and security of employment. Future qualitative research on these issues will result in a fuller understanding of salary under-reporting.

If this paper stimulates scholars to conduct further quantitative and qualitative studies of both this and other illegal labour practices (e.g., undeclared employment, bogus self-employment), and perhaps explore further the use of institutional theory to support a social actor rather than rational actor explanation of such practices, then it will have fulfilled one of its major intentions. If this then results in greater consideration of how to tackle these illegal labour practices, and governments recognising that illegal labour practices are a symptom of systemic problems, which simply detecting and punishing the individuals engaged in such practices cannot resolve, the paper will have fulfilled its wider intention.

References

Allingham, M. and Sandmo, A. (1972). 'Income tax evasion: a theoretical analysis'. Journal of Public Economics, 1: 323-38.

Alm, J. and Torgler, B. (2011). 'Do ethics matter? tax compliance and morality'. Journal of Business Ethics, 101: 635–51.

Andrews, D., Caldera Sanchez, A. and Johansson, A. (2011). Towards a Better Understanding of the Informal Economy. Paris: OECD Economics Department Working Paper no. 873, OECD.

Barrett, R. and Mayson, S. (2007). 'Human resource management in growing small firms'. Journal of Small Business and Enterprise Development, 14: 307-320.

Baumol, W.J. and Blinder, A. (2008). Macroeconomics: principles and policy. Cincinnati, OH: South-Western Publishing.

Benmore, G, and Palmer, A. (1996). 'Human resource management in small firms: keeping it strictly informal'. Journal of Small Business and Enterprise Development, 3: 109-18.

Chang, J.J., and Lai, C.C. (2004). 'Collaborative tax evasion and social norms: why deterrence does not work'. Oxford Economic Papers, 56: 344-368.

Charron, N., Dijkstra, L. and Lapuente, V. (2014). 'Mapping the regional divide in Europe: a measure for assessing quality of government in 206 European regions'. Social Indicators Research. DOI: 10.1007/s11205-014-0702-y.

Chavdarova, T. (2014). 'Envelope wages', Paper presented at the States and States of Informality Conference, Sofia, 5 September.

Davis, M. (2006). Planet of slums. London: Verso.

De Soto, H. (1989). The Other Path. London: Harper and Row.

De Soto, H. (2001) The Mystery of Capital: why capitalism triumphs in the West and fails everywhere else. London: Black Swan.

Eurofound (2013). Tackling Undeclared Work in 27 European Union Member States and Norway: approaches and measures since 2008. Dublin: Eurofound.

European Commission (2013). Employment and Social Developments in Europe 2013. Brussels: European Commission.

Eurostat (2014a). GDP per capita in PPS. Available at: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00114

Eurostat (2014b). Implicit tax rate on labour, Available at http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00119&plugin=0

Eurostat (2014c). Current taxes on income, wealth etc, Available at http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00018&plugin=0

Eurostat (2014d). Severe material deprivation, Available at http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdsc270

Eurostat (2014e). Income inequalities. Available at: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tessi180&plugin=1

Eurostat (2014f). Labour market policy interventions, <http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Labour_market_policy_interventions> (accessed February 14 2014)

Gallin, D. (2001). 'Propositions on trade unions and informal employment in time of globalisation'. Antipode, 19: 531-49.

Hasseldine, J. and Li, Z. (1999). 'More tax evasion research required in new millennium'. Crime, Law and Social Change, 31**:** 91-104.

Helmke, G. and Levitsky, S. (2004). 'Informal institutions and comparative politics: a research agenda'. Perspectives on Politics, 2: 725-40.

ILO (2014). Transitioning from the informal to the formal economy. Geneva: ILO.

Kapelyushnikov, R., Kuznetsov, A. and Kuznetisova, O. (2010). 'The role of the informal sector, flexible working time and pay in the Russian labour market mode'. Post-Communist Economies, 24: 177-190.

Kirchgässner, G. (2010). Tax Morale, Tax Evasion and the Shadow Economy. St Gallen: Discussion Paper no. 2010-17, Department of Economics, University of St. Gallen, St. Gallen, Switzerland.

Kirchler, E. (2007). The Economic Psychology of Tax Behaviour. Cambridge: Cambridge University Press.

Kirchler, E., Kogler, C. and Muehlbacher, S. (2014). 'Cooperative tax compliance: from deterrence to deference'. Current Directions in Psychological Science, 23: 87-92.

Klepper, S. and Nagin, D. (1989). 'Tax compliance and perceptions of the risks of detection and criminal prosecution'. Law and Society Review, 23: 209-40.

Kukk, M. and Staehr, K. (2014). 'Income underreporting by households with business income: evidence from Estonia'. Post-Communist Economies, 26: 257-226.

La Porta, R. and Shleifer, A. (2014). 'Informality and development'. Journal of Economic Perspectives, 28: 109-126.

Lewis, A. (1959). The Theory of Economic Growth. London: Allen and Unwin.

Lill, L. and Nurmela, K. (2009). Notification letters from Tax and Customs Board, Estonia, available at https://eurofound.europa.eu/areas/labourmarket/tackling/cases/ee001.htm

London, T. and Hart, S.L. (2004). 'Reinventing strategies for emerging markets: beyond the transnational model'. Journal of International Business Studies, 35: 350-70.

Meriküll, J. and Staehr, K. (2010). 'Unreported employment and envelope wages in mid-transition: comparing developments and causes in the Baltic countries'. Comparative Economic Studies, 52: 637-670.

Molero, J.C. and Pujol, F. (2012). 'Walking inside the potential tax evader's mind: tax morale does matter'. Journal of Business Ethics, 105: 151-162.

Murphy, K. (2005). 'Regulating more effectively: the relationship between procedural justice, legitimacy and tax non-compliance'. Journal of Law and Society, 32: 562-89.

Murphy, K. (2008). 'Enforcing tax compliance: to punish or persuade?'. Economic Analysis and Policy, 38: 113-35.

Neef, R. (2002). 'Aspects of the informal economy in a transforming country: the case of Romania'. International Journal of Urban and Regional Research, 26: 299-322.

North, D.C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.

Nwabuzor, A. (2005). 'Corruption and development: new initiatives in economic openness and strengthened rule of law'. Journal of Business Ethics, 59: 121-38.

OECD (2008). Handbook on Constructing Composite Indicators: methodology and user guide. Paris: OECD Publications.

OECD (2003). Labour Market and Social Policies in the Baltic Countries. Paris: OECD.

Pfeffermann, D. (1993). 'The role of sampling weights when modelling survey data'. International Statistical Review 61: 317-37.

Putniņš, T. and Sauka, A. (2015). 'Measuring the shadow economy using company managers'. Journal of Comparative Economics, 43: 471-490.

Round, J., Williams, C.C. and Rodgers, P. (2008). 'Corruption in the post-Soviet workplace: the experiences of recent graduates in contemporary Ukraine'. Work, Employment and Society, 22: 149-166.

Rousseau, D.M. (1995). Psychological contracts in organizations: understanding written and unwritten agreements. Thousand Oaks, CA: Sage.

Saeed, A. and Shah, A. (2011). 'Enhancing tax morale with marketing tactics: a review of the literature'. African Journal of Business Management, 5: 13659-65.

Sasunkevich, O. (2014), "Business as casual: shuttle trade on the Belarus-Lithuania border", in Morris, J. and Polese, A. (Eds.), The Informal Post-Socialist Economy: embedded practices and livelihoods, Routledge, London, pp. 135-51.

Sauvy, A. (1984). Le *Travail Noir et l'Economie de Demain*. Paris: Calmann-Levy.

Sedlenieks, K. (2003). 'Cash in an envelope: corruption and tax avoidance as an economic strategy in Contemporary Riga'. In: K-O. Arnstberg and T. Boren (eds). Everyday Economy in Russia, Poland and Latvia. Stockholm: Almqvist and Wiksell, 42-62.

Slavnic, Z. (2010). 'Political economy of informalization'. European Societies, 12: 3-23.

Solon G., Haider, S.J. and Wooldridge, J. (2013). What are we weighting for? Cambridge: National Bureau of Economic Research Working Paper No. 18859.

Taiwo, O. (2013). 'Employment choice and mobility in multi-sector labour markets: theoretical model and evidence from Ghana'. International Labour Review, 152: 469-92.

Torgler, B. (2012). 'Tax morale, Eastern Europe and European enlargement'. Communist and Post-Communist Studies, 45: 11-25.

TUC (2008). Hard Work, Hidden Lives: the short report of the Commission on Vulnerable Employment. London: TUC

Vanderseypen, G., Tchipeva, T., Peschner, J., Rennoy, P. and Williams, C.C. (2013). 'Undeclared work: recent developments', in European Commission (ed.), Employment and Social Developments in Europe 2013. Brussels: European Commission, 231-74.

Varma, K. and Doob, A. (1998). 'Deterring economic crimes: the case of tax evasion'. Canadian Journal of Criminology, 40: 165-84.

Wenzel, M. (2006). 'A letter from the tax office: compliance effects of informational and interpersonal fairness'. Social Fairness Research, 19: 345-64.

Williams, C.C. (2007). 'Tackling undeclared work in Europe: lessons from a study of Ukraine'. European Journal of Industrial Relations, 13: 219–237.

Williams, C.C. (2009). 'Beyond the formal/informal employment dualism: the prevalence and geographies of "quasi-formal" employment in the European Union'. European Urban and Regional Studies, 16: 147-59.

Williams, C.C. (2013). 'Evaluating cross-national variations in the extent and nature of informal employment in the European Union'. Industrial Relations Journal, 44: 479-94.

Williams, C.C. (2014a). Confronting the Shadow Economy: evaluating tax compliance behaviour and policies. Cheltenham: Edward Elgar.

Williams, C.C. (2014b). 'Explaining cross-national variations in the prevalence of envelope wages: some lessons from a 2013 Eurobarometer survey'. Industrial Relations Journal, 45: 524-542.

Williams, C.C. and Padmore, J. (2013). 'Envelope wages in the European Union'. International Labour Review, 152: 411-30.

Williams, C.C. and Round, J. (2007). 'Beyond negative depictions of informal employment: some lessons from Moscow'. Urban Studies, 44: 2321-2338.

Williamson, O. (2002). 'The lens of contract: private ordering'. American Economic Review, 92: 438-43.

Winship, C. and Radbill, L. (1994). 'Sampling weights and regression analysis'. Sociological Methods and Research, 23: 230-57.

Woolfson, C. (2007). 'Pushing the envelope: the "informalisation" of labour in post-communist new EU member states'. Work, Employment & Society, 21: 551-64.

Table 1. Prevalence of salary under-reporting in the EU-28, by type of business and employee group

	% employees receiving under-reported salaries in prior year	% of gross salary received as envelope wage (median)	% of all under-reported salary employees	% of all employees
All EU28	3	25	100	100
Firm size:				
1 - 4 employees	5	30	19	10
5 – 9	5	23	20	11
10 – 19	5	23	24	13
20 – 49	3	20	16	15
50 – 99	1	35	5	11
100 – 499	1	25	8	16
500 or more	1	28	8	24
Occupation:				
Professional (doctor, lawyer, accountant, architect)	3	20	6	6
Top, middle management, supervisor	1	30	8	21
Employed mainly at desk	1	20	8	20
Employed travelling (salesperson, driver)	4	20	9	7
Service job not at desk (hospital, restaurant, police, etc.)	2	20	14	17
Skilled manual worker	5	30	35	22
Unskilled manual worker	7	50	17	7
Gender:				
Man	3	25	63	53
Woman	2	30	37	47
Age:				
15-24	6	25	17	9
25-34	3	25	27	23
35-44	3	20	28	28
45-54	2	30	21	27
55-64	1	15	6	12
65+	3	25	1	1
Age formal education ended:				
<15	3	28	10	9
16-19	3	30	63	50
20+	2	20	27	41
Difficulties paying bills:				
Most of the time	6	30	20	10
From time to time	4	30	39	29
Almost never/never	2	20	41	61
Detection risk:				
Very small	4	40	22	16
Fairly small	2	25	36	45
Fairly high	3	20	31	32
Very high	4	15	11	7
Tax morality (mean = 2.33):				
Below mean	2	30	36	59
Above mean	4	25	64	41

Table 2. Cross-national variations in the prevalence of salary under-reporting, by EU member state

Region/ country	Number of formal employees surveyed	% of formal employees receiving under-reported salaries	% of gross income received as envelope wage (median)
EU-28	11,025	3	25
East-Central Europe	4,670	6	30
Latvia	509	11	50
Croatia	328	8	35
Romania	391	7	9
Slovakia	497	7	20
Bulgaria	442	6	30
Hungary	442	6	20
Lithuania	414	6	20
Czech Republic	502	5	25
Estonia	434	5	40
Poland	381	5	20
Slovenia	330	4	20
Southern Europe	1,626	4	50
Greece	260	7	10
Spain	279	5	100
Portugal	312	3	100
Cyprus	211	2	50
Italy	417	2	65
Malta	147	0	--
Western Europe	3,548	1	10
Belgium	406	4	5
Luxembourg	247	3	11
Netherlands	384	3	5
Austria	520	2	10
Ireland	394	2	8
United Kingdom	497	2	20
France	429	1	6
Germany	671	1	30
Nordic nations	1,181	1	3
Denmark	423	2	1
Finland	342	1	4
Sweden	416	1	5

.

Table 3. Multilevel logistic regressions of the propensity to receive under-reported salaries

	Model 1			Model 2			Model 2a			Model 2b		
Fixed part	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)
Constant	-3.062	0.405 ***	0.047	-2.519	0.424 ***	0.081	-3.285	0.400 ***	0.037	-3.213	0.402 ***	0.040
Gender (Women)												
Men	0.401	0.128 ***	1.493	0.404	0.127 ***	1.498	0.406	0.127 ***	1.501	0.402	0.127 ***	1.495
Age (Centred age: 41)	-0.020	0.005 ***	0.980	-0.019	0.005 ***	0.981	-0.019	0.005 ***	0.981	-0.019	0.005 ***	0.981
Formal education (15 and under)												
16-19	0.545	0.283 *	1.725	0.544	0.281 *	1.723	0.545	0.281 *	1.725	0.544	0.281 *	1.723
20+	0.182	0.309	1.200	0.221	0.307	1.247	0.223	0.307	1.250	0.214	0.307	1.239
Difficulties paying bills last year (Most of the time)												
From time to time	-0.555	0.161 ***	0.574	-0.525	0.160 ***	0.591	-0.524	0.160 ***	0.592	-0.531	0.160 ***	0.588
Almost never/never	-1.150	0.176 ***	0.317	-1.054	0.178 ***	0.349	-1.055	0.177 ***	0.348	-1.068	0.178 ***	0.344
Occupation (Employed position, at desk)												
Employed professional	0.496	0.302	1.642	0.485	0.301	1.624	0.472	0.301	1.603	0.494	0.301	1.638
General, middle management, supervisor etc.	0.190	0.253	1.209	0.227	0.253	1.255	0.219	0.253	1.245	0.226	0.253	1.253
Employed position, travelling	0.805	0.247 ***	2.237	0.817	0.246 ***	2.264	0.808	0.246 ***	2.243	0.821	0.247 ***	2.272
Employed position, service job	0.313	0.233	1.368	0.355	0.234	1.426	0.347	0.233	1.414	0.354	0.234	1.425
Skilled manual worker	0.674	0.213 ***	1.961	0.696	0.213 ***	2.005	0.685	0.213 ***	1.983	0.699	0.213 ***	2.012
Unskilled manual worker, etc.	0.556	0.282 **	1.744	0.615	0.283 **	1.850	0.608	0.282 **	1.836	0.610	0.283 **	1.841
Company size (1-4 employees)												
5 – 9	-0.185	0.206	0.831	-0.180	0.205	0.835	-0.181	0.205	0.835	-0.180	0.205	0.835
10 – 19	-0.253	0.196	0.776	-0.247	0.194	0.781	-0.248	0.194	0.780	-0.247	0.195	0.781
20 – 49	-0.546	0.204 ***	0.579	-0.538	0.202 ***	0.584	-0.538	0.202 ***	0.584	-0.539	0.203 ***	0.583
50 – 99	-1.034	0.250 ***	0.356	-1.019	0.249 ***	0.361	-1.019	0.249 ***	0.361	-1.021	0.249 ***	0.360
100 – 499	-1.117	0.242 ***	0.327	-1.076	0.242 ***	0.341	-1.076	0.241 ***	0.341	-1.083	0.242 ***	0.339
500 or more	-1.420	0.272 ***	0.242	-1.341	0.273 ***	0.261	-1.341	0.272 ***	0.262	-1.354	0.273 ***	0.258
Detection risk (Very small)												
Fairly small	-0.173	0.163	0.841	-0.155	0.162	0.856	-0.157	0.162	0.855	-0.157	0.162	0.855
Fairly high	-0.177	0.175	0.838	-0.169	0.174	0.845	-0.169	0.173	0.845	-0.170	0.174	0.844
Very high	0.100	0.242	1.105	0.091	0.241	1.095	0.095	0.241	1.100	0.090	0.241	1.094
Tax morality (Centred)	0.286	0.031 ***	1.331	0.285	0.030 ***	1.330	0.286	0.030 ***	1.331	0.285	0.031 ***	1.329
Modernisation Index				-1.371	0.365 ***	0.254						
GDP per capita in PPS 2013 (Centred)							-0.014	0.004 ***	0.986			
European Quality of Government Index 2013 (Centred)										-0.350	0.108 ***	0.705
N			8741			8741			8741			8741
Random part												
Country-level variance			0.2512***			0.1014***			0.0846**			0.1321***
(Standard error)			0.1033			0.0656			0.0626			0.0719
Countries			28			28			28			28
Variance at country level (%)			7.09			2.99			2.51			3.86

Table 3. Multilevel logistic regressions of the propensity to receive under-reported salaries – continued

	Model 3			Model 3a			Model 3b			Model 4		
Fixed part	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)
Constant	-2.121	0.825 **	0.120	-3.116	0.404 ***	0.044	-3.115	0.403 ***	0.044	-2.475	0.452 ***	0.084
Gender (Women)												
Men	0.398	0.128 ***	1.489	0.398	0.128 ***	1.489	0.403	0.128 ***	1.497	0.399	0.127 ***	1.490
Age (Centred age: 41)	-0.020	0.005 ***	0.981	-0.020	0.005 ***	0.981	-0.019	0.005 ***	0.981	-0.019	0.005 ***	0.981
Formal education (15 and under)												
16-19	0.557	0.284 **	1.746	0.558	0.283 **	1.747	0.539	0.282 *	1.715	0.554	0.282 **	1.740
20+	0.197	0.309	1.218	0.199	0.309	1.220	0.210	0.308	1.234	0.204	0.307	1.226
Difficulties paying bills last year (Most of the time)												
From time to time	-0.551	0.161 ***	0.576	-0.551	0.161 ***	0.576	-0.548	0.161 ***	0.578	-0.528	0.161 ***	0.590
Almost never/never	-1.137	0.176 ***	0.321	-1.135	0.176 ***	0.321	-1.111	0.176 ***	0.329	-1.079	0.178 ***	0.340
Occupation (Employed position, at desk)												
Employed professional	0.479	0.302	1.614	0.477	0.302	1.612	0.490	0.302	1.632	0.468	0.301	1.596
General, middle management, supervisor etc.	0.178	0.253	1.195	0.178	0.253	1.195	0.207	0.253	1.230	0.196	0.253	1.217
Employed position, travelling	0.804	0.247 ***	2.234	0.804	0.247 ***	2.234	0.814	0.247 ***	2.257	0.801	0.247 ***	2.228
Employed position, service job	0.308	0.233	1.360	0.308	0.233	1.361	0.337	0.234	1.401	0.323	0.233	1.381
Skilled manual worker	0.670	0.213 ***	1.954	0.670	0.213 ***	1.954	0.691	0.214 ***	1.997	0.678	0.213 ***	1.970
Unskilled manual worker, etc.	0.549	0.282 *	1.731	0.549	0.282 *	1.731	0.589	0.283 **	1.803	0.575	0.282 **	1.777
Company size (1-4 employees)												
5 – 9	-0.179	0.206	0.836	-0.178	0.206	0.837	-0.183	0.206	0.833	-0.183	0.205	0.833
10 – 19	-0.248	0.196	0.780	-0.248	0.195	0.780	-0.254	0.195	0.776	-0.252	0.195	0.777
20 – 49	-0.537	0.204 ***	0.584	-0.537	0.204 ***	0.585	-0.545	0.203 ***	0.580	-0.535	0.203 ***	0.585
50 – 99	-1.029	0.250 ***	0.358	-1.028	0.250 ***	0.358	-1.032	0.250 ***	0.356	-1.021	0.250 ***	0.360
100 – 499	-1.108	0.242 ***	0.330	-1.107	0.242 ***	0.331	-1.109	0.242 ***	0.330	-1.090	0.242 ***	0.336
500 or more	-1.413	0.272 ***	0.243	-1.412	0.272 ***	0.244	-1.392	0.272 ***	0.249	-1.370	0.273 ***	0.254
Detection risk (Very small)												
Fairly small	-0.168	0.162	0.846	-0.167	0.162	0.846	-0.167	0.162	0.846	-0.157	0.162	0.855
Fairly high	-0.174	0.175	0.840	-0.174	0.175	0.840	-0.177	0.174	0.838	-0.167	0.174	0.846
Very high	0.095	0.242	1.100	0.095	0.242	1.099	0.094	0.242	1.098	0.100	0.242	1.105
Tax morality (Centred)	0.288	0.031 ***	1.334	0.288	0.031 ***	1.334	0.282	0.031 ***	1.326	0.287	0.031 ***	1.332
State over-interference Index	-0.054	0.042	0.947									
Implicit tax rate on labour 2012 (Centred)				-0.028	0.021	0.972						
Current taxes on income, wealth, etc. 2013 (Centred)							-0.042	0.022 *	0.959			
State under-intervention Index										-1.247	0.435 ***	0.287
N			8741			8741			8741			8741
Random part												
Country-level variance			0.2170***			0.2142***			0.1960***			0.1515***
(Standard error)			0.0952			0.0945			0.0899			0.0773
Countries			28			28			28			28
Variance at country level (%)			6.19			6.11			5.62			4.40

Table 3. Multilevel logistic regressions of the propensity to receive under-reported salaries - continued

	Model 4a			Model 4b			Model 4c			Model 4d		
Fixed part	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)	β	se(β)	Exp(β)
Constant	-3.173	0.402 ***	0.042	-3.120	0.404 ***	0.044	-3.089	0.399 ***	0.046	-3.100	0.403 ***	0.045
Gender (Women)												
Men	0.399	0.128 ***	1.491	0.398	0.128 ***	1.489	0.400	0.128 ***	1.493	0.402	0.128 ***	1.494
Age (Centred age: 41)	-0.020	0.005 ***	0.981	-0.019	0.005 ***	0.981	-0.020	0.005 ***	0.981	-0.019	0.005 ***	0.981
Formal education (15 and under)												
16-19	0.539	0.282 *	1.714	0.571	0.283 **	1.770	0.513	0.282 *	1.671	0.566	0.283 **	1.761
20+	0.182	0.308	1.200	0.202	0.308	1.224	0.177	0.307	1.194	0.211	0.308	1.235
Difficulties paying bills last year (Most of the time)												
From time to time	-0.535	0.161 ***	0.586	-0.535	0.161 ***	0.586	-0.548	0.161 ***	0.578	-0.541	0.161 ***	0.582
Almost never/never	-1.090	0.177 ***	0.336	-1.106	0.178 ***	0.331	-1.125	0.176 ***	0.325	-1.113	0.177 ***	0.329
Occupation (Employed position, at desk)												
Employed professional	0.486	0.301	1.626	0.475	0.302	1.608	0.479	0.302	1.615	0.481	0.302	1.618
General, middle management, supervisor etc.	0.201	0.253	1.222	0.188	0.253	1.207	0.195	0.253	1.216	0.196	0.253	1.216
Employed position, travelling	0.807	0.247 ***	2.242	0.797	0.247 ***	2.219	0.812	0.247 ***	2.252	0.800	0.247 ***	2.225
Employed position, service job	0.323	0.233	1.382	0.307	0.233	1.360	0.331	0.234	1.392	0.321	0.233	1.378
Skilled manual worker	0.679	0.213 ***	1.972	0.668	0.213 ***	1.951	0.683	0.213 ***	1.981	0.678	0.213 ***	1.970
Unskilled manual worker, etc.	0.571	0.282 **	1.770	0.554	0.282 **	1.740	0.580	0.282 **	1.787	0.570	0.282 **	1.768
Company size (1-4 employees)												
5 – 9	-0.186	0.206	0.830	-0.177	0.206	0.838	-0.191	0.206	0.826	-0.183	0.206	0.833
10 – 19	-0.255	0.195	0.775	-0.243	0.195	0.784	-0.264	0.195	0.768	-0.252	0.195	0.777
20 – 49	-0.546	0.203 ***	0.579	-0.528	0.204 ***	0.590	-0.556	0.203 ***	0.573	-0.536	0.203 ***	0.585
50 – 99	-1.032	0.249 ***	0.356	-1.017	0.250 ***	0.362	-1.040	0.250 ***	0.353	-1.023	0.250 ***	0.360
100 – 499	-1.097	0.242 ***	0.334	-1.092	0.242 ***	0.335	-1.121	0.242 ***	0.326	-1.097	0.242 ***	0.334
500 or more	-1.382	0.272 ***	0.251	-1.386	0.273 ***	0.250	-1.411	0.272 ***	0.244	-1.387	0.273 ***	0.250
Detection risk (Very small)												
Fairly small	-0.158	0.162	0.854	-0.162	0.163	0.850	-0.171	0.162	0.843	-0.163	0.162	0.850
Fairly high	-0.165	0.174	0.848	-0.171	0.174	0.843	-0.176	0.174	0.839	-0.172	0.174	0.842
Very high	0.095	0.242	1.100	0.097	0.242	1.102	0.102	0.242	1.107	0.106	0.242	1.111
Tax morality (Centred)	0.286	0.031 ***	1.332	0.288	0.031 ***	1.334	0.283	0.031 ***	1.327	0.287	0.031 ***	1.333
Severe material deprivation 2013 (Centred)	0.028	0.010 ***	1.028									
Income inequality 2013 (Centred)				0.195	0.102 *	1.215						
Public expenditure on labour market interventions 2012 (Centred)							-0.230	0.105 **	0.795			
Impact of social transfers 2013 (Centred)										-0.019	0.009 **	0.981
N			8741			8741			8741			8741
Random part												
Country-level variance			0.1653***			0.2049***			0.1789***			0.1939***
(Standard error)			0.0798			0.0906			0.0858			0.0881
Countries			28			28			28			28
Variance at country level (%)			4.78			5.86			5.16			5.57

Notes: Significant at *** p<0.01, ** p<0.05, * p<0.1. All coefficients are compared to the benchmark category, shown in brackets. Indicators were centred to the mean obtained using weighting scheme. To avoid excessive influence, the GDP of Luxembourg was capped at 150 in the analyses presented here. For Public expenditure on labour market interventions, the latest available data were from 2010 for Greece and from 2011 for Cyprus and UK. For Impact of Social Transfer, the latest available data for Ireland were from 2012.

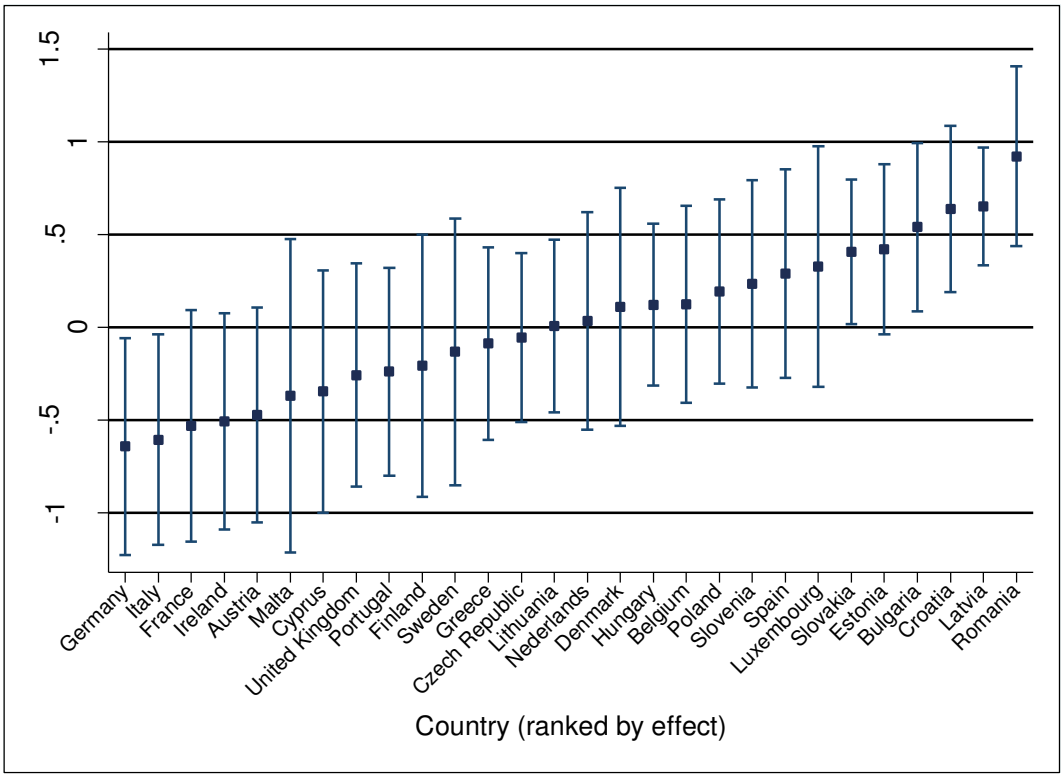

Figure 1 Cross-national variations in the propensity to under-report salaries in the EU-28: residual country effects within a 95 per cent confidence interval

APPENDIX

Table A1. Correlations amongst the country level variables

	GDP per capita in PPS 2013	European Quality of Government Index 2013	Implicit tax rate on labour 2012	Current taxes on income, wealth, etc. 2013	Severe material deprivation 2013	Income inequality 2013	Public expenditure on labour market interventions 2012
European Quality of Government Index 2013	0.886 ***						
Implicit tax rate on labour 2012	0.401 ***	0.321 ***					
Current taxes on income, wealth, etc. 2013	0.764 ***	0.870 ***	0.217 ***				
Severe material deprivation 2013	-0.867 ***	-0.911 ***	-0.477 ***	-0.754 ***			
Income inequality 2013	-0.544 ***	-0.580 ***	-0.472 ***	-0.385 ***	0.648 ***		
Public expenditure on labour market interventions 2012	0.691 ***	0.665 ***	0.443 ***	0.586 ***	-0.630 ***	-0.319 ***	
Impact of social transfers 2013	0.647 ***	0.713 ***	0.227 ***	0.593 ***	-0.642 ***	-0.770 ***	0.438 ***

Significant at ***p<0.001