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Re-theorising participation in undeclared work in the European Union: lessons from a 2019 Eurobarometer survey

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ABSTRACT
When explaining participation in undeclared work, the dominant theorisation views undeclared workers as rational economic actors participating in undeclared work when the benefits exceed the expected costs of being caught and punished. An alternative theorisation views participants' in the undeclared economy as social actors driven into undeclared work by their lack of vertical trust (in governments) and horizontal trust (in others). To evaluate these perspectives, this paper reports data from 27,565 interviews conducted for a 2019 Eurobarometer survey on undeclared work in 28 European countries. This reveals that raising the expected costs of being caught and punished has no significant impact on the likelihood of conducting undeclared work. However, greater vertical and horizontal trust have a significant impact on preventing participation in undeclared work, and vertical and horizontal trust also moderate the effectiveness of using penalties and detection to deter engagement in undeclared work. The implication for theory is that a social actor perspective is advocated. The result is a call for a policy shift away from the dominant deterrence approach that increases the penalties and risks of detection, and towards a policy approach focused on improving vertical and horizontal trust.

Introduction

In recent decades, there has been recognition that undeclared work is not disappearing over time and remains a persistent feature of European societies (OECD 2017; ILO 2018; World Bank 2019). Indeed, Williams

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et al. (2017) estimate that in the European Union (EU), 11.6% of total labour input in the private sector is undeclared. This has negative consequences. Undeclared workers have significantly poorer working conditions (ILO 2015; Williams and Horodnic 2019) and purchasers of undeclared products and services suffer from a lack of legal recourse and insurance cover (OECD 2017). Meanwhile, formal businesses suffer unfair competition from competitors operating undeclared (OECD 2017; World Bank 2019), whilst undeclared businesses have limited access to capital to expand and lack legal protection (Loayza 2018). Moreover, governments suffer from a loss of tax revenue and regulatory control over working conditions which limits the ability of societies to achieve greater social inclusion and cohesion (ILO 2018; World Bank 2019). As a result, tackling undeclared work has risen up the policy agenda in supra-national institutions (ILO 2015; European Commission 2016; OECD 2017; World Bank 2019) and European governments (Williams 2019).

To explain participation in undeclared work, the dominant theory for over half a century has been that undeclared workers are rational economic actors who engage in such work when the perceived benefits exceed the expected costs of being caught and punished (Allingham and Sandmo 1972). However, the recognition that many do not engage in undeclared work when the benefits are greater than the costs has stimulated an alternative social actor approach (Alm *et al.* 2012; Kirchler 2007; Williams *et al.* 2015). This explains participation in undeclared work as arising when there is a lack of vertical trust in government (Alm *et al.* 2010; Torgler 2007) and more recently a lack of horizontal trust of citizens in each other (Hallsworth *et al.* 2017; Lefebvre *et al.* 2015). The aim of this paper is to evaluate the validity of these competing theorisations by reporting a 2019 Eurobarometer survey composed of 27,565 interviews in 28 European countries.

To commence, the next section reviews the rational economic actor and social actor theoretical perspectives towards undeclared work and the discussions on whether they are competing or complementary theories. The third section then introduces the data and methodology to evaluate these theories, namely a probit regression analysis of 27,565 interviews conducted in 28 European countries in September 2019. The fourth section reports the findings. Revealing no association between participation in undeclared work and the costs of being caught and punished, but a significant positive association between participation in undeclared work and vertical and horizontal trust, and some interaction effects, the fifth and final section then discusses the implications for theory and policy, along with the limitations of the study and future research required.

Throughout this paper, undeclared work refers to paid activities which are not declared to the authorities for tax, social security and/or labour law purposes when they should be declared (Boels 2014; European Commission 2016; Hodosi 2015; OECD 2017). This reflects the consensus of both academics and practitioners. If paid activities are illegal in other respects, such as the products or services which are provided are illegal (e.g. counterfeit goods, illegal drugs), then these paid activities are not defined as undeclared work but rather, part of the wider criminal economy.

Explaining undeclared work: a review of competing theoretical perspectives

For much of the twentieth century, undeclared work was often conceptualised as low-paid waged employment conducted by marginalised populations out of economic necessity in the absence of alternative means of livelihood (for a review, see Williams and Nadin 2014). Based on this conceptualisation of undeclared work, enforcement authorities sought to eradicate such work by increasing the penalties for, and risk of detection of, the unscrupulous employers using such labour (Allingham and Sandmo 1972). However, during the last few decades, a more nuanced and variegated understanding of undeclared work has emerged (e.g. Williams and Windebank 2005). Firstly, it has been recognised that much undeclared work is conducted by workers on a self-employed basis, rather than as waged employment (ILO 2018). Secondly, it has been recognised that these workers engage in undeclared work not only solely due to their 'exclusion' from declared work and welfare but also often 'exit' the declared economy as a matter of choice (Maloney 2004; Williams and Round 2010). As a result, questions have arisen about how to explain participation in undeclared work. It is this body of literature that is the focus of this paper.

Reviewing the literature on explaining participation in undeclared work, it becomes quickly obvious that two contrasting theoretical perspectives exist. Each is here analysed in turn along with whether they are competing or complementary perspectives.

Rational economic actor perspective

The origins of the rational economic actor theorisation lie in Bentham's (1983 [1788]) utilitarian theory of crime that explains citizens as

participating in criminal acts when the expected costs (i.e. the likelihood of being caught and punished) do not outweigh the benefits. During the late 1960s, Becker (1968) popularised this approach, arguing that for acting lawfully to become the rational choice for citizens, governments needed to increase the sanctions and likelihood of detection. A few years later, Allingham and Sandmo (1972) applied this to tax non-compliance, arguing that tax evasion occurs when the benefits outweigh the expected costs. To alter the cost/benefit ratio, a call was made to increase the actual and/or perceived risks of detection and penalties to act as a deterrent.

This rational economic actor perspective and the accompanying deterrence approach has been subsequently widely adopted (Grabiner 2000; Hasseldine and Li 1999; Richardson and Sawyer 2001; Williams 2019). A 2017 survey of the official government representatives on the European Commission's European Platform Tackling Undeclared Work reveals that penalties are ranked the most important policy measure for tackling undeclared work followed by improving the risk of detection and are also perceived as the most effective measures (Williams 2019).

However, the evidence to support this is mixed. Some studies find that increasing the risk of detection and/or penalties prevents undeclared work (Blackwell 2010; Kluge and Libman 2017; Mas'ud et al. 2015), with increasing the risk of detection commonly identified as more effective than higher penalties (Alm 1999; Williams and Horodnic 2017a, 2017b). However, other studies find that increasing detection and punishments has no effect (Dularif et al. 2019; Hartl et al. 2015; Williams and Franic 2016) and yet others that it results in more undeclared work due to the resultant breakdown of the social contract between citizens and the state (Chang and Lai 2004; Kirchler et al. 2014; Mohdali et al. 2014; Murphy 2005, 2008). In consequence, to evaluate this rational economic actor approach, the following hypothesis can be tested:

Rational economic actor hypothesis (H1): Higher expected penalties and probabilities of detection reduce the likelihood of participation in undeclared work, ceteris paribus.

H1a: Higher expected penalties reduce the likelihood of participation in undeclared work, ceteris paribus.

H1b: Higher expected probabilities of detection reduce the likelihood of participation in undeclared work, ceteris paribus.

Social actor perspective

In their seminal paper, the founders of the rational economic actor approach stated, 'This is a very simple theory, and it may perhaps be criticized for giving too little attention to nonpecuniary factors in the taxpayer's decision on whether or not to evade taxes' (Allingham and Sandmo 1972: 326). Indeed, it has been subsequently found that many do not participate in undeclared work when the benefit/cost ratio suggests they should if they were truly rational economic actors (Alm *et al.* 2010; Kirchler 2007; Murphy 2008). To explain this, a social actor approach has emerged (Williams *et al.* 2015).

Drawing inspiration from a variant of institutional theory (Helmke and Levitsky 2004; North 1990), in which institutions represent the rules of the game which direct the behaviour of the actors in society, participation in undeclared work is explained as arising when there is a gap between the codified laws and regulations of a society's formal institutions ('state morale') and the socially shared unwritten rules of its informal institutions ('civic morale'). This gap reflects the level of vertical trust, which can be measured using the level of tax morale (i.e. the intrinsic motivation to pay taxes). When this gap is large, tax morale is low and participation in undeclared work is high (Alm *et al.* 2010; Torgler 2007, 2011). This finding that the lower is the level of vertical trust, the greater is the participation in undeclared work, has been shown in studies of individual European countries (Williams and Franic 2016; Windebank and Horodnic 2017), different European regions (Williams and Horodnic 2017b) and for the EU as a whole (Williams and Horodnic 2017a; Williams *et al.* 2015).

In recent years, moreover, a second wave of social actor theory has asserted that participation in undeclared work is not only determined by vertical trust (between government and citizens) but also horizontal trust (between citizens), in the sense of trusting other individuals not to work undeclared (Baric 2016; Fellner *et al.* 2013). Citizens are more likely to engage in undeclared work when they consider it pervasive in their community, not least because they are then less worried about the likelihood of being caught and punished but also because they consider that if it common to disobey the rules of the game, they will do so too. Until now, however, only laboratory experiments have found that engaging in undeclared work is conditional upon the behaviour of others (Alm 1999, 2012; Alm *et al.* 1999; Chang and Lai 2004; Fellner *et al.* 2013; Hallsworth *et al.* 2017; Lefebvre *et al.* 2015; Traxler 2010).

Therefore, to evaluate this social actor approach, the following hypothesis can be tested:

Social actor hypothesis (H2): Improving vertical and horizontal trust reduces the likelihood of participation in undeclared work, ceteris paribus.

H2a: Improving vertical trust reduces the likelihood of participation in undeclared work, ceteris paribus.

H2b: Improving horizontal trust reduces the likelihood of participation in undeclared work, ceteris paribus.

Rival or complementary perspectives

In the sense that many scholars ascribe to either the rational economic actor or social actor theories, they are rival perspectives. However, a small group of scholars has argued that they are not mutually exclusive and debated the most effective sequencing of the measures.

On the one hand, a 'responsive regulation' approach envisages a regulatory pyramid, sequenced from measures to improve vertical (and horizontal) trust at the bottom and used first, to the use of deterrents and penalties at the top and used last. The argument is that authorities should start with building vertical and horizontal trust and only when these fail to elicit behaviour change with some groups, are incentives used to improve the benefits of declared work and deterrents only as a last resort when all other measures have failed (Braithwaite 2002, 2009; Job *et al.* 2007).

On the other hand, a 'slippery slope' approach argues that governments should concurrently use the deterrence measures of the rational economic actor approach to increase the power of authorities and the social actor measures of improving vertical and horizontal trust (Kirchler *et al.* 2008; Kastlunger *et al.* 2013; Khurana and Diwan 2014; Muehlbacher *et al.* 2011; Prinz *et al.* 2013). Using mainly laboratory experiments, participants are shown to be more compliant when both power and trust are high, and therefore using the two approaches concurrently is seen as the most effective means of tackling undeclared work (Kogler *et al.* 2015; Muehlbacher *et al.* 2011; Williams and Horodnic 2017a).

Until now, however, the potentially complex interaction effects of combining these approaches is poorly understood. For example, imposing higher penalties and improving the probability of detection may not always produce the same outcome. It may vary at different levels of

vertical trust. When vertical trust is high, for example, increasing the risks of detection and penalties might result in greater participation in undeclared work, due to a breakdown of trust between the state and its citizens (Chang and Lai 2004; Kirchler *et al.* 2014), but less participation in undeclared work when vertical trust is low. Put another way, vertical trust may moderate the impacts of increasing the risks of detection and penalties on participation in undeclared work. Therefore, there is a need for a more nuanced comprehension of the interactions between deterrents and vertical and horizontal trust. As such, the following hypothesis can be tested:

> *Moderating impacts of vertical trust hypothesis* (H3): The effects of higher expected penalties and probabilities of detection on the likelihood of participation in undeclared work are moderated by vertical trust, ceteris paribus.

> *H3a*: The effects of higher expected penalties on the likelihood of participation in undeclared work are moderated by vertical trust, ceteris paribus.

> *H3b*: The effects of higher expected probabilities of detection on the likelihood of participation in undeclared work is moderated by vertical trust, ceteris paribus.

> *Moderating impacts of horizontal trust hypothesis* (H4): The effects of higher expected penalties and probabilities of detection on the likelihood of participation in undeclared work are moderated by horizontal trust, ceteris paribus.

> *H4a*: The effects of higher expected penalties on the likelihood of participation in undeclared work are moderated by horizontal trust, ceteris paribus.

> *H4b*: The effects of higher expected probabilities of detection on the likelihood of participation in undeclared work is moderated by horizontal trust, ceteris paribus.

Methodology

Data

To evaluate these theorisations, data is reported from 27,565 interviews undertaken in September 2019 in 28 European countries (the 27 European Union member states and the UK) in Eurobarometer special survey 92.1. All interviews were conducted in the national language with adults aged 15 years and older. A multi-stage random (probability) sampling methodology was used, which ensured that on the issues of gender, age, region and locality size, both the national and each level of the sample is representative in proportion to its population size.

In this paper, the results are analysed for all 28 European countries and 5 European regions to evaluate whether different theories apply in each region. These are the Nordic region (Denmark, Finland, Sweden), Western Europe (Belgium, Luxembourg, Netherlands, Austria, Ireland, United Kingdom, France, Germany), East-Central Europe (Czechia, Estonia, Latvia, Lithuania, Poland and Slovakia), Southern Europe (Italy, Malta, Spain and Portugal) and South-East Europe (Bulgaria, Croatia, Cyprus, Greece, Hungary, Romania and Slovenia).

Variables

To evaluate engagement in undeclared work, the dependent variable is a dummy variable with value 1 for respondents answering 'yes' to the question of 'Apart from a regular employment, have you yourself carried out any undeclared paid activities in the last 12 months?', and value 0 otherwise.

To evaluate the theories, four explanatory variables are used. First, to examine the perceived penalty for engaging in undeclared work, a dummy variable is used, with value 0 for normal tax or social security contributions due and value 1 for normal tax or social security contributions due, plus a fine or prison. Second, to examine the perceived risk of detection, a dummy variable is used with value 0 for a very small or fairly small risk and value 1 for a fairly high or very high risk.

Third, to analyse vertical trust, tax morale is used as a measure because a lack of trust in formal institutions is manifested in a low tax morale (Alm and Torgler 2006), so it is a proxy measure of the lack of vertical trust between citizens and government. Participants were asked to rate the acceptability of five types of undeclared work using a 10-point Likert scale (where 1 means absolutely unacceptable and 10 means absolutely acceptable), namely: an individual is hired by a household and s/he does not declare the payment received to the tax or social security authorities even though it should be declared; a firm is hired by a household and it does not declare the payment received to the tax or social security authorities; a firm is hired by another firm and it does not declare its activities to the tax or social security authorities; a firm hires an individual and all or a part of the wages paid to him/her are not officially declared, and someone evades taxes by not declaring or only partially declaring their income. An aggregate tax morale index for each respondent was constructed by collating their responses to the five questions. The index is represented in the original 10-point Likert scale format,

meaning that the lower the index value, the higher is their tax morale. The Cronbach's Alpha coefficient of the scale which shows a good internal consistency of the scale (Kline 2000) is 0.8888 for Europe as a whole, 0.8424 for the Nordic nations, 0.8703 for Western Europe, 0.8701for East-central Europe, 0.9317 for Southern Europe and 0.9237 for South-East Europe.

Fourth and finally, to analyse horizontal trust, participants were asked 'Do you personally know any people who work without declaring their income or part of their income to tax or social security institutions?'. This proxy measure of horizontal trust has been used in previous studies of undeclared work (Williams *et al.* 2015; Horodnic and Williams 2020). A dummy variable is used for horizontal trust with value 1 for those who know someone who undertakes undeclared work and 0 otherwise. Those answering value 1, 'yes', means that they perceive others to engage in undeclared work and therefore have lower horizontal trust.

Meanwhile, and drawing upon past studies evaluating engagement in undeclared work (Horodnic and Williams 2020; Williams and Horodnic 2017a, 2021), the control variables selected are gender, age, employment status, people 15+ years in own household, children, difficulties paying bills, and urban/rural area (see Table 1). In recent years, some scholars have questioned the wisdom of controlling for multiple variables, fearing that causal relationships will be obscured (Pearle and Mackenzie 2018). To evaluate this, therefore, we tested the results when control variables were not included. The finding was that the same significances and directions of association were identified between participation in

Table 1. Control variables used: definitions.

Variables	Definition
Gender	A dummy variable with value 0 for females and 1 for males
Age	A continuous variable indicating the exact age of a respondent
Occupation	A categorical variable grouping respondent by their occupation with value 1 for self-employed, value 2 for employed, and value 3 for not working
People 15+ years in own household	A categorical variable for people 15+ years in respondent's household (including the respondent) with value 1 for one person, value 2 for two persons, value 3 for 3 persons or more
Children	A dummy variable for the presence of children up to 14 years old in the household with value 0 for individuals with no children and value 1 for those having children
Difficulties paying bills	A categorical variable for the respondent difficulties in paying bills with value 1 for having difficulties most of the time, value 2 for occasionally, and value 3 for almost never/never
Area	A categorical variable for the area where the respondent lives with value 1 for rural area or village, value 2 for small or middle-sized town, and value 3 for large town

undeclared work and the explanatory variables both when the control variables were included and when they were excluded. Here, in consequence, we have included the control variables, not least to reveal who engages in undeclared work.

Analytical methods

Probit regression analysis is used for testing hypothesis about the relationship between a categorical dependent variable and one or more categorical or continuous independent variables (Greene 2018). Therefore, it is here used. The maximum likelihood method is used to estimate the least squares function. The log-likelihood function for probit is

$$\ln L = \sum_{j \in S} \omega_j \ln \phi(x_j \beta) + \sum_{j \notin S} \omega_j \ln\{1 - \phi(x_j \beta\}$$

where ϕ is the standard cumulative normal and ω_j denotes the optional weights. $\ln L$ is maximised. Using probit analysis, the following model is adopted:

$$\Pr(\mathcal{Y}_j \neq 0 | x_j) = \phi(x_j \beta)$$

The dependent variable of the model ($\mathcal{Y}_j$) is binary, undeclared work, which represents engagement in undeclared work, x represents the explanatory variables including the control variables, which are expected sanction, detection risk, level of tax morality, level of horizontal trust, gender, age, employment status, people 15+ years in own household, children, difficulties paying bills, and area (see Table 1 for a description of the variables). Moreover, the interaction term is used for investigating moderating effects.

Findings

As Table 2 reveals, 3.7% of the European citizens surveyed in 2019 reported engaging in undeclared work during the past 12 months, and this ranged from 4.6% in the Nordic nations to 3.3% in Southern Europe. These figures, it should be noted, are participation rates, and not measures of the size of the undeclared economy.

Who, therefore, participates in undeclared work? Table 2 reveals that men are more likely to do so than women, as are younger people, both in Europe as a whole and all European regions. The self-employed are over-

Table 2. Descriptive statistics of those engaging and not engaging in undeclared work in Europe, 2019: by European region.

	EU28		Western		Southern		East-Central		South-East		Nordic	
	Y	*N*	*Y*	*N*	*Y*	*N*	*Y*	*N*	*Y*	*N*	*Y*	*N*
Engaged in undeclared work (%)	*3.7*	*96.3*	*3.8*	*96.2*	*3.3*	*96.7*	*3.6*	*96.4*	*3.4*	*96.6*	*4.6*	*95.4*
Expected sanctions (%)												
Tax or social security contributions due	34	27	32	20	32	25	51	42	30	30	21	19
Tax or social security contributions + fine or prison	66	73	68	80	68	75	49	58	70	70	79	81
Detection risk (%)												
Very small/Fairly small	70	55	69	56	72	56	68	50	69	51	77	69
Fairly high/Very high	30	45	31	44	28	44	32	50	31	49	23	31
Tax morality – vertical trust (mean)	3.87	2.39	4.05	2.43	3.36	1.99	4.52	2.81	3.62	2.45	3.32	1.90
Know anyone who works undeclared-horizontal trust (%)												
Yes	82	37	80	33	90	42	79	32	84	44	82	39
No	18	63	20	67	10	58	21	68	16	56	18	61
Gender (%)												
Female	40	54	47	52	48	52	39	61	38	55	28	48
Male	60	46	53	48	52	48	61	39	62	45	72	52
Age (mean)	41	51	39	52	36	51	44	50	44	48	43	57
Occupation (%)												
Self-Employed	12	7	10	6	14	10	9	7	13	9	16	6
Employed	45	45	40	43	48	42	51	48	48	49	43	41
Not working	43	48	50	51	38	48	40	45	39	42	41	53
People 15+ years in own household												
One	26	24	27	27	23	16	32	27	19	15	31	33
Two	45	51	40	53	43	49	46	50	45	50	57	55
Three and More	29	25	33	20	44	35	22	23	36	35	12	12
Children (%)												
No children	72	76	72	76	66	77	73	74	75	73	72	80
Having children	28	24	28	24	34	23	27	26	25	27	28	20

(*Continued*)

Table 2. Continued.

	EU28		Western		Southern		East-Central		South-East		Nordic	
Area (%)												
Rural area or village	32	33	36	34	34	35	30	33	31	36	30	20
Small or middle-sized town	40	38	40	39	46	41	37	36	30	28	50	53
Large town	28	29	24	27	20	24	33	31	39	36	20	27
Difficulties paying bills (%)												
Most of the time	17	6	12	5	35	9	15	6	26	14	3	1
From time to time	28	24	26	17	33	36	30	21	34	37	18	6
Almost never/never	55	70	62	78	32	55	55	73	40	49	79	93

Source: 2019 Eurobarometer 92.1 survey.

represented in the undeclared workforce and those not working under-represented both in Europe as a whole and all European regions. Single person households are over-represented (except in Western Europe and the Nordic nations), as are larger households (except in East-Central Europe and the Nordic nations) and those with children (except in South-East Europe). Undeclared work is more concentrated in rural areas in Nordic nations, and urban areas in South-East Europe and East-Central Europe. Those having difficulties paying the bills most of the time are over-represented in the undeclared workforce both in Europe as a whole and all European regions. Despite this, 55% of the undeclared workforce almost never or never have such difficulties (79% in Nordic nations and 62% in Western Europe), intimating that undeclared work is not confined to poorer populations.

Do those engaged in undeclared work have different perceptions than those do not engaged regarding the expected penalties and risks of detection, and vertical and horizontal trust? Those not engaging in undeclared work are more likely to perceive both the expected sanction and likelihood of detection as higher than undeclared workers. This tentatively intimates that increasing the expected penalties and risk of detection prevents participation in undeclared work. Similarly, undeclared workers have lower vertical trust (measured in terms of tax morale) and horizontal trust compared with those not engaging in undeclared work both in Europe as a whole and all European regions.

To analyse if these descriptive results remain valid when other variables are introduced and held constant, Table 3 reports probit estimates of the likelihood of participating in undeclared work in Europe as a whole and each European region. Analysing who engages in undeclared work, men are significantly more likely than women in Europe as a whole and all European regions (with the exception of Western Europe and Southern Europe where it is not a significant difference). Younger people are significantly more likely than older people in both Europe as a whole and all European regions. In Europe as a whole, compared with self-employed persons, those employed and not working are significantly less likely to engage in undeclared work, and this also applies in Western Europe and the Nordic nations. In other regions, there are no significant differences by employment status. Compared with single person households, larger households are significantly less likely to engage in undeclared work in Europe as a whole, but in all regions, the same trend is either only weakly significant or not significant at all. Similarly, although those with children are significantly less likely to work

Table 3. Probit estimates of the propensity to participate in undeclared work In Europe, 2019: by European region.

	EU-28 β (Robust se)	Western Europe β (Robust se)	Southern Europe β (Robust se)	East Central Europe β (Robust se)	South East Europe β (Robust se)	Nordic β (Robust se)
Expected sanctions (Tax or social security contributions due)						
+ fine or prison	−0.0490	−0.214	0.0360	0.345*	−0.0174	−0.457*
	(0.0985)	(0.186)	(0.311)	(0.197)	(0.228)	(0.264)
Detection risk (Very small/Fairly small)						
Fairly high/Very high	0.00333	−0.102	0.363	−0.308	0.136	0.378
	(0.0875)	(0.152)	(0.311)	(0.195)	(0.202)	(0.231)
Tax morality	0.124***	0.115***	0.215***	0.152***	0.0984***	0.144**
	(0.0150)	(0.0314)	(0.0526)	(0.0281)	(0.0315)	(0.0586)
Horizontal Trust	0.878***	0.811***	1.192***	0.852***	0.932***	0.717***
	(0.0828)	(0.147)	(0.295)	(0.156)	(0.183)	(0.265)
Gender (Female)						
Male	0.218***	0.0843	0.0838	0.361***	0.261***	0.317***
	(0.0368)	(0.0649)	(0.114)	(0.0838)	(0.0771)	(0.108)
Age (Exact age)	−0.0157***	−0.0196***	−0.0262***	−0.00734***	−0.0104***	−0.0196***
	(0.00116)	(0.00208)	(0.00416)	(0.00269)	(0.00257)	(0.00294)
Occupation (Self-employed)						
Employed	−0.285***	−0.429***	−0.154	−0.192	−0.143	−0.659***
	(0.0617)	(0.117)	(0.176)	(0.148)	(0.123)	(0.158)
Not working	−0.169***	−0.242**	−0.185	−0.152	−0.0801	−0.496***
	(0.0625)	(0.117)	(0.186)	(0.152)	(0.127)	(0.158)
People 15+ years in own household (One)						
Two	−0.0984**	−0.0146	−0.143	−0.163	−0.183*	0.116
	(0.0470)	(0.0813)	(0.180)	(0.101)	(0.110)	(0.120)
Three and more	−0.153***	0.0663	−0.170	−0.221*	−0.204*	−0.188
	(0.0523)	(0.0897)	(0.185)	(0.121)	(0.114)	(0.176)
Children (No children)						
Having children	−0.118***	−0.142*	−0.0498	−0.0591	−0.140	−0.161
	(0.0447)	(0.0787)	(0.130)	(0.105)	(0.0950)	(0.130)

Area (Rural area or village)						
Small or middle-sized town	0.0129	−0.0449	0.0119	−0.00000407	0.125	−0.294**
	(0.0433)	(0.0752)	(0.137)	(0.0986)	(0.0988)	(0.118)
Large town	−0.0947**	−0.141*	−0.222	0.0113	0.0841	−0.522***
	(0.0468)	(0.0851)	(0.161)	(0.104)	(0.0929)	(0.147)
Difficulties paying bills (Most of the time)						
From time to time	−0.329***	−0.286**	−0.602***	−0.336**	−0.346***	0.126
	(0.0608)	(0.126)	(0.160)	(0.150)	(0.104)	(0.346)
Almost never/never	−0.398***	−0.401***	−0.805***	−0.577***	−0.296***	−0.350
	(0.0553)	(0.116)	(0.150)	(0.140)	(0.0999)	(0.329)
Interactions						
Sanction × Tax morality	0.0217	0.00878	−0.0473	−0.0348	0.0545	0.0588
	(0.0163)	(0.0342)	(0.0563)	(0.0338)	(0.0337)	(0.0602)
Detection × Tax morality	−0.0351**	−0.0115	−0.0345	−0.0321	−0.0559*	−0.0588
	(0.0155)	(0.0298)	(0.0562)	(0.0340)	(0.0321)	(0.0496)
Sanction × Horizontal Trust	−0.0653	0.00763	−0.0149	−0.320*	−0.0978	0.333
	(0.0891)	(0.159)	(0.306)	(0.183)	(0.198)	(0.266)
Detection × Horizontal Trust	−0.165**	−0.0505	−0.611**	0.293	−0.327*	−0.603**
	(0.0831)	(0.146)	(0.311)	(0.183)	(0.185)	(0.241)
Constant	−1.275***	−0.773***	−1.107***	−1.811***	−1.834***	−0.507
	(0.138)	(0.266)	(0.405)	(0.315)	(0.290)	(0.466)
N	21,222	6758	2630	4341	4835	2658
Pseudo R^2	0.1862	0.2165	0.2797	0.1986	0.1481	0.2521
Log pseudolikelihood	−2727.943	−858.3822	−275.2287	−533.2973	−607.2170	−367.9708
χ^2	984.97	352.29	158.99	255.70	162.62	176.30
$p>$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Significant at ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Standard errors in parentheses. All coefficients are compared to the benchmark category, shown in brackets. When multiple imputation techniques are used (10 imputations were simulated through a system of chained equations for every missing value) for addressing missing responses, the same variables are significantly associated with participation in undeclared work. Therefore, no imputation is used, to minimise bias.
Source: Eurobarometer 92.1 survey 2019.

undeclared than those with no children in Europe as a whole, but again is either weaker or not significant in all regions. Citizens in larger urban areas are significantly less likely to work undeclared compared with rural areas or villages in Europe as a whole, and Nordic nations, but elsewhere there are no significant differences. Finally, those who have difficulties paying bills most of the time are significantly more likely to engage in undeclared work than those who only have difficulties from time to time or never have having difficulties. This is similarly the case in all regions (except the Nordic nations).

Turning to the hypotheses on participation in undeclared work is significantly and the expected penalties and risk of detection, and vertical and horizontal trust, the first finding is that there is no association between the expected penalties and participation in undeclared work in Europe as a whole. The view that increasing the penalties reduces undeclared work is only valid in Nordic nations where it is weakly significant. Similarly, no significant association exists between a perceived higher risk of detection and participation in undeclared work either in Europe as a whole or any European region. However, there is a strong significant association between vertical trust and participation in undeclared work in Europe as a whole and all European regions. The greater the vertical trust, the lower is the likelihood of participation in undeclared work. Similarly, the greater the horizontal trust in others, the significantly lower is the likelihood of engaging in undeclared work in Europe as a whole and all regions. Hence, there is no difference in the significant explanatory variables across the different European regions.

Examining whether vertical and horizontal trust moderate the effects and effectiveness of penalties and risk of detection, the interactions display that this is sometimes the case. Although vertical and horizontal trust do not in general moderate the effects and effectiveness of penalties (except in East-Central Europe where lower horizontal trust makes increased penalties more effective), they do significantly moderate the effects of the risk of detection. The lower the vertical and horizontal trust, the significantly more effective is a greater risk of detection at preventing undeclared work at a European level. However, the only region where vertical trust significantly influences the effectiveness of the risk of detection in reducing undeclared work is in South-East Europe, whilst horizontal trust significantly moderates the effectiveness of the risk of detection on preventing undeclared work in Southern Europe, South-East Europe and the Nordic countries.

Discussion and conclusions

To evaluate the rational economic actor and social actor theorisations of undeclared work, and the effects of combining them, data has been reported from the 2019 Eurobarometer survey on undeclared work. As Table 4 summarises, increasing the expected penalties and risk of detection is not significantly associated with preventing undeclared work in Europe as a whole. However, higher vertical and horizontal trust is significantly associated with preventing undeclared work, and there are some significant interaction effects when they are used together.

Theoretically, therefore, this paper advances knowledge by revealing firstly, that there is little evidence at the European or regional level to support the rational economic actor theorisation, but support is found for the social actor perspective. Secondly, there is a need for the social

Table 4. Validity of hypotheses.

Hypothesis	Europe	West	Southern	East-Central	South-East	Nordic
Rational economic actor hypothesis (H1):						
H1a: Higher expected penalties reduce the likelihood of participation in undeclared work	R	R	R	R	R	R
H1b: Higher expected probabilities of detection reduce the likelihood of participation in undeclared work	R	R	R	A	R	R
Social actor hypothesis (H2):						
H2a: Vertical trust reduces the likelihood of participation in undeclared work	A	A	A	A	A	A
H2b: Horizontal trust reduces the likelihood of participation in undeclared work	A	A	A	A	A	A
Moderating effects of vertical trust hypothesis (H3):						
H3a: The effects of higher expected penalties on the likelihood of participation in undeclared work is moderated by vertical trust	R	R	R	R	R	R
H3b: The effects of higher expected probabilities of detection on the likelihood of participation in undeclared work is moderated by vertical trust	A	R	R	R	A	R
Moderating effects of horizontal trust hypothesis (H4):						
H4a: The effects of higher expected penalties on the likelihood of participation in undeclared work is moderated by horizontal trust	R	R	R	A	R	R
H4b: The effects of higher expected probabilities of detection on the likelihood of participation in undeclared work is moderated by horizontal trust	A	R	A	R	A	A

Note: 'A' = hypothesis accepted. 'R' = hypothesis rejected.

actor approach to focus upon not only vertical but also horizontal trust. Thirdly, the interaction effects are revealed. When enforcement authorities increase the expected probability of detection, this is effective for those with lower vertical and horizontal trust but is less effective on those with higher vertical and horizontal trust. In future studies, greater investigation of these moderating effects is needed. Furthermore, a limitation of this survey, due to the cost constraints of adding extra questions, is that the specific formal institutions (e.g. judiciary, politicians, tax administrations, labour inspectorates, local governments) in which there is a lack of trust are not identified, and various forms of horizontal trust could in future be studied beyond the one used in this study (i.e. generalised trust).

In terms of policy implications, this paper reveals the need for the deterrence approach of the rational economic actor perspective to be replaced by a policy approach focused upon improving vertical and horizontal trust. How, therefore, can firstly vertical trust be enhanced? Viewed through the lens of institutional theory, low vertical trust is a measure of the lack of alignment of the laws, codes and regulations of formal institutions with the norms, beliefs and values of informal institutions (Helmke and Levitsky 2004; North 1990). To reduce this gap, either the informal or formal institutions can be changed. On the one hand, altering the norms, values and beliefs regarding the acceptability of undeclared work can be achieved by educating citizens and raising awareness about the benefits of declared work. Policy initiatives might include government providing citizens with better information on where taxes are spent along with 'your taxes are paying for this' signs in hospitals, on ambulances and on public construction projects. Indeed, many good practices of how to raise awareness about the benefits of declared work can be found on social media under #EU4Fair-Work which is the hashtag used in 2020 by the 27 EU member states in their campaign on the benefits of declared work, coordinated by the European Commission's European Platform Tackling Undeclared Work (European Commission 2020). The population groups have been here identified to target with such campaigns. At a European level, it is men, younger people, the self-employed, single-person households and people with no children, those living in rural areas and villages, and who have difficulties paying the bills most of the time. There are slight variations across European regions. In Nordic nations, for example, it is men, younger people, the self-employed and those living in rural areas and villages.

On the other hand, improvements in vertical trust can be pursued by changing the formal institutions. As previous studies reveal, undeclared work reduces when there is procedural fairness, in that citizens believe they are paying their fair share (Molero and Pujol 2012), procedural justice, in that citizens believe government treats them respectfully and impartially (Kogler *et al.* 2015; Murphy 2005), and redistributive justice, in that citizens believe they receive the public goods they deserve (Kogler *et al.* 2013). It is not only a modernisation of governance through procedural and redistributive fairness and justice that is required to improve vertical trust but also specific policy initiatives that make it easier and beneficial to operate in the declared economy. These include policy initiatives to simplify compliance (Alstadsæter and Jacob 2013) and regulatory complexity (Richardson 2006), such as pre-filling tax returns (Jensen and Wöhlbier 2012; Kleven *et al.* 2011), formalisation support and advice (e.g. formalisation call centres), and regularisation initiatives to bring undeclared (and undocumented) workers into the declared economy without penalisation to improve trust. For example, in Kosovo during the COVID-19 pandemic the short-term financial support available in 2020 to declared workers and businesses was also made available to undeclared workers and their employers if they were registered with the tax authorities. The outcome was a 2.6% increase in the employment participation rate in Kosovo at a time when most countries were witnessing declines (Williams 2020).

To improve horizontal trust, governments must desist from publishing how big is the undeclared economy because this harms horizontal trust. It has become increasingly understood by policy makers that publishing figures in the media that the undeclared economy is large and extensive reduces horizontal trust and leads to higher levels of participation (Williams and Horodnic 2021). Rather, messages must display the high compliance levels in the society. Indeed, empirical research on the use of notification letters has found that the most effective messages soliciting compliant behaviour are where the recipient is informed of the high level of compliance in their occupation, sector and/or local area (Hallsworth *et al.* 2017). In future, further research is required of how to improve horizontal trust. This is not the only issue on which further research is required.

There are several limitations to this study and avenues for further research. Firstly, the Eurobarometer survey does not include a booster sample to identify the numerous EU mobile labour and undocumented third country migrants engaged in undeclared work. Whether a trust-

building approach is similarly relevant to this significant group of undeclared workers is therefore currently unknown. Future research is required to evaluate whether this is the case. Secondly, there is a need in future research to identify the specific formal institutions in which there is a lack of trust and thirdly, so too could other measures of horizontal trust be analysed beyond the generalised trust examined in the Eurobarometer survey.

Fourth and finally, although this research reveals no EU regional variations in the association between vertical and horizontal trust and participation in undeclared work, future research could evaluate the relationship between participation in undeclared work and different types of welfare system and varieties of capitalism. Until now, however, the types of welfare system and varieties of capitalism have been largely delineated by the type of formal economic and welfare system that exists, such as the Liberal Market Economies (LMEs) model often typified by the United Kingdom and the Coordinated Market Economies (CMEs) model typified by Scandinavian countries (Hall and Soskice 2001), as well as other variants such as Emergent Capitalisms (in East-Central Europe) and Mediterranean capitalism (Whitley 1999) or South European capitalism (Amable 2003). However, these types pay little attention to the roles of either the undeclared economy, due to the long-standing assumption that it is a minor residue which is gradually disappearing, or the level of vertical and horizontal trust. Future research, therefore, could reconceptualise national economic and welfare systems more in terms of the extent and nature of their undeclared economies (see Dibben and Williams 2012, Williams 2014) and level of vertical and horizontal trust. Globally, over 60% of workers have their main employment in the informal economy and all societies have differential levels of vertical and horizontal trust. This strongly intimates that shifting beyond classifying national systems by the composition of their formal economic and welfare systems and towards classifying them by the varying magnitude and character of their undeclared economies and levels of trust might be a useful way forward.

In sum, if this paper results in evaluations of these theorisations, and the interplay between them, in other countries and global regions, one intention of this paper will have been achieved. If European governments move beyond the currently dominant deterrence approach and pay greater attention to improving vertical and horizontal trust, then the wider intention will have been fulfilled.

Acknowledgements

Disclosure statement

No potential conflict of interest was reported by the author(s).

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