

Nikulin, Dagmara

## Article

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Entrepreneurial Business and Economics Review (EBER)

## Provided in Cooperation with:

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*Suggested Citation:* Nikulin, Dagmara (2023) : Driving forces of informal employment: An empirical study based on Polish enterprise data, Entrepreneurial Business and Economics Review (EBER), ISSN 2353-8821, Krakow University of Economics, Centre for Strategic and International Entrepreneurship, Krakow, Vol. 11, Iss. 3, pp. 93-106, <https://doi.org/10.15678/EBER.2023.110306>

This Version is available at:

<https://hdl.handle.net/10419/335402>

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# Driving forces of informal employment: An empirical study based on Polish enterprise data

Dagmara Nikulin

## ABSTRACT

**Objective:** The article aims to indicate the determinants of informal employment in registered enterprises using company-level evidence from Poland.

**Research Design & Methods:** The survey conducted among Polish small and medium-sized (SME) enterprises in 2018 was used to find the driving forces of informal employment in Poland. The adequate sample comprised 952 representative surveys derived from the computer-assisted telephone interview (CATI). The quantitative analysis was based on the logistic regression.

**Findings:** The findings indicate that among the main drivers of informal employment, one can distinguish the level of tax morality of owners or company managers and the administrative difficulties related to setting up a business. The role of non-economic factors in creating informal activities was confirmed. Moreover, informal employment was more prevalent in smaller companies operating in the construction industry.

**Implications & Recommendations:** Our analysis may be helpful for both research in entrepreneurship and tax evasion and the shadow economy stream. It indicates the heterogeneity among Polish enterprises related to the involvement in informal activities, particularly informal labour. Our study sheds light onto the less known dimension of 'grey activities' existing in the registered companies, which is less frequently analysed in the literature.

**Contribution & Value Added:** This evidence will help us understand the primary motives for using the informal workforce and enhance further research on the nature and extent of informal employment and the shadow economy in general.

**Article type:** research article

**Keywords:** informal employment; shadow economy; company level data; Poland; tax morality

**JEL codes:** H26, O17

Received: 2 February 2023

Revised: 7 April 2023

Accepted: 14 July 2023

## Suggested citation:

Nikulin, D. (2023). Driving forces of informal employment: An empirical study based on Polish enterprise data. *Entrepreneurial Business and Economics Review*, 11(3), 93-106. <https://doi.org/10.15678/EBER.2023.110306>

## INTRODUCTION

The informal sector and the broadly understood shadow economy are of interest to the scientific community and government institutions. In studies devoted to the shadow economy, one can notice a dichotomy between the formal and informal sectors, contributing to the marginalisation of hybrid phenomena occurring on the borderline of the informal zone. In other words, some informal activities might take place on the formal side of the economy. One of those phenomena is the informal employment existing in registered enterprises. This is the case for developed countries, where informal employment is from nature hidden, in contrast to developing countries where informal activities are widespread and more visible (Slonimczyk, 2022). In this article, I will describe the phenomenon of informal employment in registered enterprises in Poland as an example of a developed country. According to the yearly statistics provided by Statistics Poland, the informal economy in registered economic entities accounted for 8.5% in 2020 (CSO, 2022). Given that the shadow economy accounted for 10% of the total GDP in Poland (CSO, 2022), the contribution to the shadow economy from registered entities is significant.

At the same time, information about informal employment in registered enterprises is scarce. The existing sources for the data on informal employment in Poland (Eurobarometer survey 'Undeclared work,' Polish survey 'Unregistered work' conducted by Statistics Poland) are based on the labour market surveys and do not allow to separate informal work from the informal work existing in registered entities. Importantly, there is a need for further research due to the difficulties associated with data collection on informal employment.

To tackle informal employment, one needs to indicate reasons for it. In the existing literature, there are several approaches to explain the determinants of this phenomenon. As the problem is complex, no straightforward conclusions are provided regarding reasons for informal employment and policy measures to combat it. The most popular argument asserts that informal employment minimises or evades taxes (Bernasconi, Corazzini, & Seri, 2014). If the taxes are severe, the inclination to informal employment may be higher, as the rational actors desire to maximise their profits (Schneider, 2014). However, the emergent literature indicates that the rational economic actor approach should be replaced or/and complemented by the social actor theory (Horodnic & Williams, 2022). The rational economic actor decides on involvement in informal activities based on the calculation between the costs and benefits. In contrast, decisions made by the social actor are influenced by social factors like tax morality, peers' effects, or the social acceptance of tax evasion (Alm, Bloomquist, & McKee 2017). Nowadays, it is even claimed that non-economic social factors are becoming more and more relevant in explaining the inclination to be engaged in the shadow economy (Pickhardt & Prinz, 2014). Therefore, a holistic approach is needed to fully understand the motives for informal employment (Franic, 2022). One of the examples is the consideration of the impact of the institutional environment (Hanousek & Palda, 2004; Torgler & Schneider, 2007) and the tax morality of taxpayers (Cummings *et al.*, 2009).

This article aims mainly to fill the research gap on the determinants of informal employment in Poland. Therefore, the main goal is to indicate the factors of informal employment in Poland. Unlike previous studies, I relied on the primary data from a company managers survey conducted in 2018 among almost 1000 Polish private small and medium-sized enterprises (SMEs). I focused on SMEs as predominantly small companies, managed by individuals and operating in sectors which are less visible to tax administration, and therefore more likely to evade taxes (Putniņš & Sauka, 2015). As business owners and managers are directly responsible for paying taxes, it seems reasonable to ask them about the extent of informal employment (Torgler, 2011; Krasniqi & Williams, 2020). To the best of my knowledge, this is the first study on informal work determinants based on a company-level survey in Poland. On this background, my study's contribution to the existing literature is twofold. Firstly, I used a direct approach to measure the driving forces of informal work in Poland in registered entities. In general, most of the informal employment research is based on individuals instead of businesses or aggregate data (Putniņš & Sauka, 2015). Secondly, I extended the previous research on the determinants of informal employment. My results support the existing empirical evidence on the relationship between social and moral attitudes on the one hand and tax evasion behaviour on the other. I formulated the following research questions:

- RQ1:** Does the tax burden significantly impact the probability of using informal employment in enterprises?
- RQ2:** Could be the probability of using informal employment explained by the tax morality among company owners/managers?
- RQ3:** How much is the inclination to use informal employment dependent on the obstacles related to setting up a business?

Our results indicate that among the main drivers of informal employment, one can distinguish the tax morality of owners or company managers and the administrative difficulties related to setting up a business. Moreover, informal employment was more prevalent in smaller companies operating in the construction industry. The organisation of this article is as follows: introduction, literature review and hypotheses development (summarising prior research on the driving forces of informal employment), research methodology, results and discussion (presenting the results of econometric modelling), ending with conclusions.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Notably, it is argued that an effective policy for reducing informal activities requires the inclusion of many aspects of tax evasion (Andreoni, Erard, & Feinstein, 1998). Accordingly, the existing empirical evidence provides a rich strand of possible explanations for informal employment. Considering the macro estimates and cross-country differences in the extent of informal work, the level of economic development, inference in a free market and state interventions, and inadequate welfare arrangements may play a role (for review see Nikulin & Sobiechowska-Ziegert, 2017).

Focusing on the determinants that explain the individual decisions on tax evasion, predominantly, it is postulated that the inclination for informal activities is purely related to the severity of taxes (see an early study from Kaplan and Reckers, 1985). Moreover, the negative impact of the tax wedge on employment is reported in the literature (Deskar-Škrbić, Drezgić, & Šimović, 2018). However, empirical evidence on taxes and informal employment is inconclusive. On the one hand, taxpayers may be more tax compliant if the tax rates are low and the tax system is perceived as fair (Mcgee & Benk, 2019) or if the perceived tax burden is high while the trust in government and the judicial system is low (Abdixhiku *et al.*, 2017). Moreover, the tax burden may be perceived as high when people feel that taxes are used inefficiently and the tax system is excessively complex (Bazart & Blayac, 2022). Similarly, Savić *et al.* (2015) found that the countries with more efficient tax administration have a lower level of informal economy. Therefore, if tax rates are only considered, the relationship with tax avoidance is somewhat inconclusive (Nur-Tegin, 2008; Joulfaian, 2009; Bernasconi, Corazzini, & Seri, 2014) which implies no straightforward association between tax level and inclination to evade taxes. I formulated the first hypotheses based on this part of the literature review. All hypotheses are listed at the end of this section.

Another strand of research is devoted to social and moral determinants of tax evasion and informal activities. Nowadays, it is claimed that such non-economic social factors are becoming more and more relevant in explaining the inclination to be engaged in the shadow economy (Pickhardt & Prinz, 2014). In other words, it is widely argued that the decision to evade taxes may be related to the individual or social attitudes towards paying taxes. Tax morality or tax morale may be related to such determinants as fairness in a tax system and financial literacy (Alexander & Balavac-Orlic, 2022). Empirical studies show that personal moral norms and the norms of those people close to them are essential in creating taxpayers' behaviour (Bobek, Roberts, & Sweeney, 2007). Notably, several studies investigate the relationship between tax morale and the tendency to evade taxes (Alm, Martinez-Vazque, & Torgler, 2006; Alm & Torgler, 2006; Torgler, 2005). Tax morality (or tax morale) is described as intrinsic motivation to pay taxes (Torgler & Schneider, 2007) or as 'a belief in contributing to society by paying taxes' (Torgler & Schneider, 2009, p. 230). Therefore, the extent of tax evasion may be related to individuals' life satisfaction, as evidenced for Eastern European countries (Ferrer-i-Carbonell & Gërkhani, 2016). Among other factors creating tax morality, one may mention the quality of state institutions (Buehn & Schneider, 2012), the progressivity of taxes (Doerrenberg & Peichl, 2013), social capital, and political participation (Russo, 2013). Several studies confirm negative linkages between personal attitudes and tax evasion (Kaplan, Newberry, & Reckers, 1997; Kogler *et al.*, 2013; van Dijke & Verboon, 2010). For Poland, a recent experimental study showed that high trust in authorities is sufficient to decrease the tax evasion of entrepreneurs (Batrancea *et al.*, 2022). Based on the above, the second hypothesis was formulated.

The next group of informal employment determinants include institutional factors, such as the quality of institutions (Bayar *et al.*, 2018) and the government's efficiency in tax evasion (Bani-Mustafa *et al.*, 2022). The cross-country study conducted by Torgler and Schneider (2007) shows that institutional quality significantly influences the size of the shadow economy. In turn, the study by Hanousek and Palda (2004) indicates that citizens' perception of the quality of government services is an essential factor of tax evasion. Moreover, the efficiency of public money may be associated with the attitude towards paying taxes (Barone & Mocetti, 2011). Recent evidence from Bani-Mustafa *et al.* (2022) based on the sample of 138 countries confirms the role of government efficiency in reducing tax evasion. Based on the above considerations, the third hypothesis was formulated.

These prior empirical results allowed me to assume the following research hypotheses:

- H1:** There is a positive relation between the tax burden and the propensity of using informal work.
- H2:** There is a negative relation between tax morality among company owners/managers and the probability of using informal employment.
- H3:** The obstacles with setting up a business are positively associated with the higher probability of using informal employment.

## RESEARCH METHODOLOGY

In the literature on informal employment and its causes, one may observe no clear consensus on the best and most reliable methods of measuring this phenomenon and the reasons for involvement in informal activities. The core issue related to the analysis of the determinants of the shadow economy and informal work is the choice of the measurement method. There are several ways to measure the extent of informal activities (Alm, 2012). In general, direct and indirect approaches may be distinguished. The most prevalent direct methods include audits of individual returns, survey research, and declaration on tax amnesty data. On the other hand, the main assumption of the indirect approach is to follow traces indicating tax evasion.

To estimate the driving forces of informal employment in Poland, the results from the survey conducted among Polish small and medium-sized enterprises (SMEs) in 2018 were used. The adequate sample comprised 952 surveys, derived from the computer-assisted telephone interview (CATI). The representativeness of this study was ensured by using quota sampling based on the specific number of companies according to the size (less than 9 employees, 10-49, and 49-250 employees). Within each group, I distinguished a stratified random sampling scheme with two strata: NUTS 2 units (Nomenclature of Territorial Units for Statistics: 16 voivodships in Poland) and four main sectors: manufacturing, construction, retail, and services (The distribution of the sample is presented in Table A1 in Appendix). Respondents included business owners or high-level managers. Given the possible limitations of a survey, I applied a set of techniques designed for surveys with sensitive questions postulated in the related literature (Gërkhani, 2007; Tourangeau & Yan, 2007), including the 'forgiving wording technique' and the gradual introduction of questions regarding informal activities. Moreover, following the approach proposed by Sauka (2008), an indirect way of asking was employed. In particular, the informal employment activity question was formulated as follows: 'Due to high non-wage labour costs, some entrepreneurs use various mechanisms to minimize these burdens. Looking at the companies operating in your industry, please assess what proportion of employees are employed informally?' As Sauka (2008) confirms, the companies' response is similar in asking about informal activities in their company and the companies in their industry. As the strengths of this approach, I can mention the minimization of the rejection rate and enhancing the level of data reliability. At the same time, several weaknesses, mainly typical for survey studies for sensitive topics, have to be acknowledged.

The dependent variable was derived from the proportion of informal employees and recoded into a binary one, where 0 means that the respondent indicates no extent of informal employees in the companies operating in their industry and 1 indicates that there is some extent of informal employees. I used this indication as a proxy for the informal employment phenomenon in a given company. I decided to use a binary outcome variable instead of a continuous one, as the precise measurement of the prevalence of informal employment based on the survey data is highly demanding. Afterwards, following the existing literature concerning determinants of informal employment, I created a set of explanatory variables. Primarily, I focused on two factors related to the tax environment: tax morality, which expresses the perceived social approval of tax avoidance in Poland, and the tax burden, representing the severity of the taxation level. Additionally, I accounted for difficulties associated with setting up a business, which may be also related to the extent of informal employment (Hudson *et al.*, 2012). Last but not least, the extent of using informal workers may vary according to size, age, location of the company, industry, and regional characteristics (Górniak, 2015). Therefore, I also added control variables which include company characteristics (size and age) and the dummies for industry and region.

In Table 1, I present the descriptive statistics of both dependent and explanatory variables used in the empirical part of this article.

**Table 1. Descriptive statistics**

Variables	N	mean	sd	min	max
<b>Dependent variable</b>					
<i>infempl</i> (1 for any extent of informal employment)	734	0.53	0.50	0.00	1.00
<i>infempl_2</i> (the share of informal employment in total employment)	734	12.74	18.17	0	100
<b>Explanatory variables</b>					
<i>tax burden</i> (Please estimate the severity of the amount of tax burden using the following scale: 1 = no obstacle. 2 = slight obstacle. 3 = moderate obstacle. 4 = large obstacle)	952	3.19	0.86	1.00	4.00
<i>tax morality</i> (social approval of tax avoidance in Poland: 1 (strongly agree) to 5 (strongly disagree))	952	2.64	1.17	1.00	5.00
<i>setting_up_business</i> (to what extent the company's development is hampered by formalities related to setting up a business: 1 = no obstacle. 2 = slight obstacle. 3 = moderate obstacle. 4 = large obstacle)	952	1.84	0.97	1.00	4.00
<i>micro_firm</i> (1 if a company has less than 9 employees)	952	0.40	0.49	0.00	1.00
<i>small_firm</i> (1 if the company has 10-49 employees)	952	0.40	0.49	0.00	1.00
<i>medium_firm</i> (1 if the company has more than 50 employees)	952	0.20	0.40	0.00	1.00
<i>young</i> (1 if the age of the company is less than 5 years)	952	0.06	0.24	0.00	1.00
<i>average</i> (1 if the age of the company is between 5-20 years)	952	0.54	0.50	0.00	1.00
<i>old</i> (1 if the age of the company is more than 20 years)	952	0.40	0.49	0.00	1.00
<i>village</i> (1 if the company is located in a village or a city with less than 10 000 population)	952	0.26	0.44	0.00	1.00
<i>small_city</i> (1 if the company is located in a city with 10 000-100 000 population)	952	0.34	0.48	0.00	1.00
<i>big_city</i> (1 if the company is located in a city with more than 100 000 population)	952	0.40	0.49	0.00	1.00
<i>construction</i> (1 if the company operates in the construction sector)	952	0.11	0.31	0.00	1.00
<i>manufacturing</i> (1 if the company operates in the manufacturing sector)	952	0.38	0.49	0.00	1.00
<i>retail</i> (1 if the company operates in the retail sector)	952	0.10	0.29	0.00	1.00
<i>service</i> (1 if the company operates in the service sector)	952	0.42	0.49	0.00	1.00

Source: own elaboration based on the survey.

To estimate the driving forces of informal employment, the following formula was used:

$$\Pr(Y_i = 1) = F(\beta_0 + \beta_1 Reason_i + \beta_2 Firm_i + \beta_3 Industry_j + e_i) \quad (1)$$

in which  $F(z) = e^z/(1+e^z)$  is the cumulative logistic distribution,  $Reason_i$  are variables representing possible determinants of informal employment,  $Firm_i$  is a set of variables describing companies' characteristics (enterprise size, age, and location),  $Industry$  accounts for the field of economic activities aggregated to construction, retail, services and manufacturing). Moreover, I controlled heterogeneity across regions using dummy variables for voivodships (16 voivodships in Poland, see Table A1 in Appendix). As my main goal is to find possible determinants impacting informal employment, I employed logistic regression modelling to assess the probability of informal employment.

## RESULTS AND DISCUSSION

Table 2 presents the estimation results based on the model (1), including explanatory variables described in Table 1.

Regarding the driving forces of informal employment, my results show that the higher the tax morality of a company owner or manager, the lower the inclination towards using the informal workforce. Therefore, individual tax morality, described as indistinct motivation to pay taxes, plays an essential

role in explaining tax evasion behaviour. In this way, I confirmed the ongoing assumption on the importance of tax morality in creating tax evasion attitudes (Williams & Horodnic, 2015). As tax morality claims to be one of the non-economic factors of tax evasion (Alm & Torgler; 2006, Torgler & Schneider, 2009; Williams & Martínez, 2014), it should be not neglected in theoretical and empirical research on shadow economy. The first hypothesis (H1) was fully confirmed.

**Table 2. Estimation results**

Dependent variable: informal employment	(1)	(2)	(3)	(4)	(5)
tax_burden	-0.215 [0.147]	-0.239 [0.146]	-0.212 [0.147]	-0.185 [0.144]	-0.212 [0.141]
tax morality	-0.173* [0.097]	-0.174* [0.097]	-0.204** [0.099]	-0.155* [0.094]	-0.204* [0.108]
setting_up_business	0.365*** [0.126]	0.379*** [0.128]	0.413*** [0.132]	0.408*** [0.127]	0.413*** [0.124]
small_firm		-0.119 [0.188]	-0.169 [0.199]	-0.182 [0.192]	-0.169 [0.188]
medium_firm		-0.481** [0.236]	-0.515** [0.249]	-0.511** [0.230]	-0.515** [0.240]
young		0.255 [0.515]	0.321 [0.534]	0.343 [0.532]	0.321 [0.569]
old		0.053 [0.263]	0.173 [0.271]	0.121 [0.259]	0.173 [0.261]
village		-0.102 [0.327]	-0.064 [0.336]	-0.093 [0.326]	-0.064 [0.352]
big_city		0.360 [0.277]	0.436 [0.279]	0.299 [0.262]	0.436 [0.316]
construction			1.147** [0.480]	1.001** [0.458]	1.147** [0.489]
retail			0.073 [0.426]	-0.005 [0.409]	0.073 [0.425]
service			0.263 [0.303]	0.171 [0.290]	0.263 [0.303]
_cons			0.312 [0.785]	0.197 [0.631]	-0.491 [0.614]
Regional dummies	yes	yes	yes	no	yes
N	734	734	734	734	734
Wald chi2	24.03	28.13	31.02	22.15	36.28
Prob>chi2	0.1540	0.2545	0.2702	0.0358	0.1093
Pseudo R2	0.0622	0.0691	0.0830	0.0467	0.083

Notes: Standard errors are in parentheses. Models (1-4) with robust standard errors; model (5) with robust cluster errors clustered at the district level (LAU1). Weights applied. Regional dummies are not reported. Default categories: *micro\_firm*, *average\_firm*, *small\_city*, and *manufacturing*. \*p ≤ 0.10, \*\*p ≤ 0.05, \*\*\*p ≤ 0.01.

Source: own elaboration based on the survey.

Going further, I tested the assumption regarding the linkages between tax burden severity and the inclination to evade taxes. As past evidence indicates an inconclusive association between the level of taxes and the extent of informal activities (Nur-Tegin, 2008; Joulfaian, 2009), my results confirmed this complex relation. In particular, I could not find a statistically significant relationship between the tax burden and the inclination to use informal employment. Thus, the assumption that the tax level is not the core driving force of informal activities was justified. Therefore, the second hypothesis (H2) was rejected. The lack of straightforward association between tax burden and inclination to evade taxes may be explained by the fact that the taxpayers' decisions are impacted not only by the pure tax level, but also by the whole tax system and the general trust in government and juristic system (Abdixhiku *et al.*, 2017; Bernasconi *et al.*, 2017).

Besides, I tested the relation between the perceived difficulties of starting a business and an inclination to hire an informal workforce. I found that in companies where the owners or managers assess the difficulties related to setting up a business as severe, the propensity to use informal labour is greater. This may be explained by the fact that those initial obstacles may encourage entrepreneurs to hire workers on informal terms to minimize costs. Moreover, Krasniqi and Williams (2020) report that entrepreneurs who start their business informally have a higher probability of achieving growth objectives.

Analysing the control variables, I can see that informal employment is less prevalent in medium-sized enterprises, which may lead to the conclusion that mainly micro and small (below 50 employees) companies use an informal workforce. This finding aligns with the previous evidence concerning Baltic countries presented by Putniņš and Sauka (2015), showing that smaller firms tend to use an informal workforce to gain a competitive advantage over larger enterprises. It also supports the evidence for 26 transition economies provided by Abdixhiku *et al.* (2017). With reference to the age of the enterprises, I did not find any statistically significant association regarding the involvement in informal employment. Moreover, I found that companies from the construction sector show a greater propensity to employ informal workforce which is also confirmed with regard to Baltic states (Putniņš & Sauka, 2015).

My results expand and reinforce the existing research on informal employment studies. Regarding Poland, the main conclusions are in line with the research conducted by Nikulin (2020) who examines the factors impacting tax evasion proxied by underreporting of business income among Polish entrepreneurs. Similarly, the findings of Bayar *et al.* (2018) demonstrate the significance of institutional factors, such as corruption, in elucidating the extent of the shadow economy in transitional economies.

In the next step, I provided a robustness check as an extension of our baseline estimations. Instead of the binary outcome variable indicating whether the company uses informal labour or not, I employed a count variable indicating the proportion of informal workforce to total employment (*infempl\_2*). I decided to use zero-inflated negative binomial regression dedicated to data where a significant part of the observations of a dependent variable equals zero. In our case, nearly 48% of answers indicated no share of informal employees. Figure 1A in the Appendix presents the distribution of the dependent variable. Moreover, using this modelling technique, I could distinguish between factors which influence the probability of informal employment (the logit part of the model: zero-inflated model) and the extent of informal employment (the count model: negative binomial model). Table 3 presents the results of the regression analysis using the zero-inflated negative binomial regression model reporting the zero-inflated part.

Firstly, by analysing the results presented in Table 3, I could check which factors impact the decision whether to use informal labour. Again, in line with our baseline estimates presented in Table 2, I confirm that the higher the tax morality, the lower the probability of using informal labour (as the coefficient for variable tax morality is positive it means a higher probability of zero, which in our model accounts for no use of informal workers). Moreover, the remaining factors, like the difficulties related to setting up a business, the size of the company, and the sector of activity indicate the same relation as in the baseline estimation.

## CONCLUSIONS

The main aim of this article was to find determinants of informal employment in Poland. For this purpose, I used a company-level survey conducted among Polish enterprises. With the use of survey techniques dedicated to sensitive questions, the respondents consisting of owners or high-level managers were asked about their opinion and indication on the informal activities in Poland, and on possible obstacles in running a business.

The empirical part of this article was based on the econometric model, in which I used possible determinants of informal employment selected from the existing literature. Regarding the first hypothesis (H1), I did not find that the tax burden significantly impacts the probability of using informal employment. As the previous studies indicate no strong association in this matter (Nur-Tegin, 2008; Joulfaian, 2009), our study confirmed the lack of direct links between tax burden and tax evasion. Moreover, given the recent study for Poland conducted by Batrancea *et al.* (2022), in which the authors indicated the role of

**Table 3. Econometric analysis results using a zero-inflated negative binomial regression model**

Dependent variable: informal employment_2	(1)	(2)	(3)	(4)	
<b>Zero-inflated model</b>					
tax_burden	0.138 [0.094]	2.041*** [0.317]	1.666*** [0.421]	0.155* [0.094]	
tax morality	0.127* [0.066]	1.941*** [0.252]	1.856*** [0.333]	0.117* [0.065]	
setting_up_business	-0.282*** [0.085]	-3.005*** [0.305]	-2.326*** [0.228]	-0.269*** [0.082]	
small_firm	0.190 [0.180]	6.256*** [1.015]	2.234*** [0.605]	-	
medium_firm	0.501** [0.223]	2.887*** [0.689]	2.988*** [0.844]		
young	0.122 [0.359]	10.332*** [1.152]	99.910*** [3.770]		
old	0.029 [0.168]	1.733*** [0.616]	3.536*** [0.639]		
village	0.179 [0.210]	8.150*** [0.970]	0.126 [0.846]		
big_city	-0.140 [0.187]	-1.592** [0.670]	-3.929*** [0.773]		
construction	-0.610** [0.278]	-3.301*** [1.013]	-		
retail	-0.293 [0.296]	-2.274** [0.945]			
service	-0.176 [0.187]	-5.364*** [0.745]			
_cons	-0.619*** [0.078]	-0.616*** [0.069]	-0.663*** [0.066]		-0.590*** [0.078]
Regional dummies	yes	no	yes		yes
ll	-2058.62	-1591.41	-1582.36		-2069.88
N	734	734	734		734
N_zero	347	347	347		347

Note: Zero-inflated negative binomial regression with robust standard errors; standard errors in parentheses; regional dummies included but not reported (aside from model (2)); variable description as in Table 1; default categories: micro\_firm, average\_firm, small\_city, and manufacturing. Model 1 includes all dependent variables and regional dummies, model 2 includes all dependent variables without regional dummies, model 3 does not include sectoral variables, and model 4 includes only three variables related to main research hypotheses.

\*p ≤ 0.10, \*\*p ≤ 0.05, \*\*\*p ≤ 0.01.

Source: own study.

trust in authorities (rather than enforcement) while creating tax evasion attitudes among Polish entrepreneurs, the low tax morality seems to be important in explaining the inclination to tax evasion. In this matter, I addressed the second hypothesis (H2) and found that the probability of using informal employment may be explained by the tax morality among company owners/managers. These results are in line with the past evidence presented in the related literature, indicating the non-economic factors like tax morality and social acceptance toward tax evasion as necessary in creating taxpayer attitudes (Williams & Horodnic, 2015). In particular, tax morality that illustrates the inner motivation to pay taxes should be considered an important determinant of tax compliance. This point of view is recently emphasized in the literature (see *e.g.*, Alm & Torgler, 2011). Moreover, the inclination to informal employment may be related to institutional factors, like those related to starting own business (H3). In this way, I confirmed the tax morality and obstacles related to setting up a business as significant factors influencing the probability of using informal labour. Moreover, I employed a set of control variables consisting of firm characteristics like age, location,

and sector type. I reported that smaller firms and those operating in the construction industry are more inclined towards using informal workers, which may be related to more substantial competitive pressure in small entities (Putniņš & Sauka, 2015).

This study contributes to the existing literature by providing new evidence of the determinants of using informal work from the perspective of enterprises. Thus far, there has been a lack of empirical studies in Poland focusing on the informal work in registered enterprises. Given the topic's relevance and the difficulties and scarcity of statistical data on informal work, this study contributes to the knowledge of the shadow economy. As I utilised primarily data collected via enterprise survey, the results are helpful in better explaining the reasons for using informal work in formally registered enterprises.

Moreover, knowing the determinants that might enhance the probability of using informal work would help create proper policy measures. In general, the measures addressed in tackling the informal work may be either 'hard' or 'soft' in nature. 'Hard' solutions are mainly based on deterrence measures like increased detection probability or penalty severity. 'Soft' solutions are directed towards increasing the awareness of benefits from tax compliance or educational programmes. Regarding Poland, proposed strategies encompass various incentives to lessen the appeal of informal employment both for employees and employers. Still, a very widely used solution is inspections conducted by The National Labour Inspectorate (PIP). In the case of detection of informal employment, PIP may impose sanctions and penalties on employers. At the same time, various forms of financing are addressed for employers, such as subsidies for creating new jobs, training for employees or development of company infrastructure. This type of financial support can help to cover some of the costs related to employment, thus encouraging formal employment.

This study reveals the importance of morality in explaining the probability of using informal work. It is not an easy task to enhance a level of tax morality among taxpayers. Following Alm and Torgler (2006), extensive educational information campaigns, tax system fairness, and trust in government may enhance tax morality. Explaining to citizens how their taxes are used can help increase their tax willingness. Showing concrete examples of tax-funded public services, such as schools, hospitals, and infrastructure can convince people that paying taxes directly impacts their quality of life. People are more likely to pay taxes when they believe the tax system is fair. This means that taxes should be proportionate to income and that all citizens, including the wealthy and corporations, should pay their fair share. A high level of trust in government and public institutions usually translates into higher tax morality. If citizens believe that the government acts in their best interests and manages public funds efficiently, they are more likely to pay taxes.

This analysis may be helpful in research on entrepreneurship, tax evasion and shadow economy stream. It indicates the heterogeneity among Polish enterprises related to the involvement in informal activities, in particular the use of informal labour. This study sheds the light onto less known dimension of 'grey activities' existing in the registered companies, which is less frequently analysed in the literature. I realize that the results contain a considerable degree of uncertainty resulting from the subjective nature of the data as well as the limitations related to the amount of data. Another limitation of this research may be related to the inferring causality: the determinants of informal employment like the tax morality may be affected by some unobservable variables, not included in our analysis. However, I believe that this evidence will help in understanding the primary motives for using informal workforce and in this way enhance further research on the nature and extent of informal employment and shadow economy in general. In particular, a larger survey sample and expansion for other countries will significantly contribute to the more profound analysis of the phenomenon of informal work in Europe. Moreover, given the global changes induced by the pandemic of Covid-19, the informal workers may be significantly impacted (Webb, McQuaid, & Rand, 2020). According to the International Labour Organization's (ILO) estimates, the increase in poverty among informal workers may be even 52 points in high-income countries and 56 points in upper-middle-income countries (ILO, 2020). A deeper investigation of the influence of the global crisis caused by coronavirus on the informal labour market may also pose interesting research areas.

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## Appendix

Table A1. Overall Sample Description

Voivodship/sector	Micro firms					Small firms					Medium-sized firms				
	Manufacturing	Construction	Retail	Services	Total	Manufacturing	Construction	Retail	Services	Total	Manufacturing	Construction	Retail	Services	Total
Lower Silesian	7	4	3	19	33	12	3	4	7	26	9	1	1	4	15
Kuyavian-Pomeranian	5	0	2	10	17	10	3	3	2	18	3	1	1	4	9
Lublin	6	2	0	8	16	10	1	1	3	15	2	1	1	2	6
Lubusz	0	1	0	9	10	2	3	0	5	10	1	1	1	1	4
Łódź	10	2	1	9	22	13	3	1	8	25	7	1	1	2	11
Lesser Poland	8	1	6	18	33	17	3	5	9	34	6	2	1	6	15
Masovian	15	10	8	38	71	32	9	4	21	66	14	6	6	20	46
Opole	2	0	2	5	9	4	2	0	3	9	2	0	0	2	4
Subcarpathian	4	0	4	7	15	10	2	0	3	15	5	0	1	2	8
Podlaskie	4	2	1	2	9	1	1	1	5	8	1	1	0	2	4
Pomeranian	4	2	1	19	26	12	3	3	6	24	7	2	0	1	10
Silesian	8	7	9	18	42	22	3	4	21	50	10	1	1	12	24
Holy Cross	5	1	1	3	10	4	1	1	4	10	4	0	0	1	5
Warmian-Masurian	3	1	1	6	11	9	1	1	1	12	4	0	0	1	5
Greater Poland	7	4	3	23	37	17	5	1	18	41	13	1	1	4	19
West Pomeranian	3	2	2	13	20	6	1	2	8	17	1	1	1	3	6
Total	91	39	44	207	381	181	44	31	124	380	89	19	16	67	191

Source: own elaboration based on the survey.

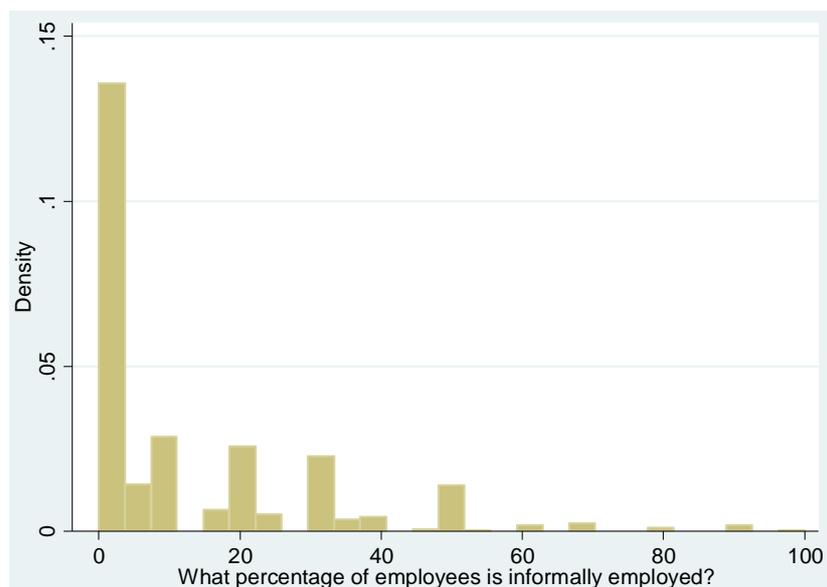


Figure A1. The distribution of the share of informal employment

Source: own elaboration based on the survey.

**Author****Dagmara Nikulin**

PhD in Economics, assistant professor, Faculty of Management and Economics, Gdańsk University of Technology, Gdańsk (Poland). Her research interest focuses on the labour market.

**Correspondence to:** dr Dagmara Nikulin, Gdańsk University of Technology, Faculty of Management and Economics, Narutowicza 11/12, 80-233 Gdańsk, e-mail: [dnikulin@zie.pg.edu.pl](mailto:dnikulin@zie.pg.edu.pl)

**ORCID**  <http://orcid.org/0000-0002-0534-4553>

**Acknowledgements and Financial Disclosure**

The article came into being within the project no. 2018/02/x/hs4/00441 entitled 'False self-employment as a part of shadow economy in Poland: Identification of the size and causes' financed by the National Science Centre in Poland conducted by Dagmara Nikulin in the years 2018-2019.

The author would like to thank the anonymous referees for their useful comments, which allowed to increase the value of this article.

**Conflict of Interest**

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Published by Krakow University of Economics – Krakow, Poland



Ministry of Education and Science  
Republic of Poland

The journal is co-financed in the years 2022-2024 by the Ministry of Education and Science of the Republic of Poland in the framework of the ministerial programme "Development of Scientific Journals" (RCN) on the basis of contract no. RCN/SP/0583/2021/1 concluded on 13 October 2022 and being in force until 13 October 2024.