

ANALYSIS OF THE SHADOW ECONOMY IN POLAND'S LOW-SKILLED LABOUR MARKET

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Abstract: *This research examines the informal employment and its fiscal impact in Poland's low-skilled labour market, focusing on the context of temporary work agencies. While many agencies work within the legal framework, many of these agencies still not declared entire works to avoid tax and social contributions fuelling shadow economy. Employing a mixed-method approach combining analysis of Special Eurobarometer 498 result and survey responses from 82 workers in Katowice and neighbouring subregions, the paper ultimately identifies the associated tax losses and employment displacement effects. Analysis indicated that each hour of undeclared work resulted in an average fiscal loss of 8.94 PLN (Eight zlotys and ninety-four groszy). Secondly, when workers perform more undeclared work hours than officially declared, the practice not only results in significant unpaid taxes and social contributions but also reduces another fair job opportunities by limiting the need to hire additional staff.*

The research finds that agencies are incentivized to commit these acts due to high profit, low chances of being caught and mild penalties, as explained by rational choice and deterrence theories. Here, regulatory "shielding" by declaring only minimum hours provides agencies security from inspection. This behaviour has an impact not only on fiscal revenues, but it actively reduces job creation and disrupts fair competition for other legitimate labour market actors.

In order to address the problem, the research advocates for higher levels of labour inspection and oversight, in addition to standardization of electronic timekeeping mechanisms, progressive penalties, and protections for whistle blowers.

Key words: *Informal Labour Market, Public Finance, Tax evasion*

JEL codes: *H24, H26, J30, J46*

1. Introduction

Effective labour market regulation is a critical component of modern economies. Government from both, developed and developing countries aim to ensure fair competition, protect labour, and promote social welfare by establishing rules and regulations regarding wages, working hours, working condition, and their rights. Establishing minimum wages rate is one of the crucial elements in effective labour market regulation which not only secures labour from exploitation but also provide confident of equality and fairness. These regulations benefits employee, employers, and at the same time it preserves the fiscal and institutional stability of a country.

In spite of legislative attempts, the shadow economy still presents in labour market and poses a significant global concern. The shadow economy (also known as grey, informal, or underground economy) refers to economic activity which falls outside the government's accounting radar (Fleming et al., 2000). Enste & Schneider (2000), Medina & Schneider (2017) defines shadow economy as legal production and sales of goods and services which are deliberately concealed from public administration to avoid taxes and market regulations. Shadow employment or informal employment is one part of the overall shadow economy. According to Williams & Windebank (2012) informal economy is defined as the paid production and sale of goods and services that are unregistered or hidden from the state for tax, social security, and/or labour law purposes but are otherwise legal. Informal employment definition also lies between the definition of informal economy. As such, informal employment is composed of three types of activity: evasion of both direct and indirect taxes; social security fraud, where the officially unemployed are working while claiming benefits; and avoidance of labour market legislation, such as employers' insurance contributions, minimum wage agreements or sub-contracting work. Aside from broad definition of shadow economy, in this paper the small fraction of the shadow economy which is related to informal and semi-formal employment is discussed.

Poland is transitioning from a primarily emigration country to one with both emigration and immigration. Migration from developing countries in Asia, East Europe, Africa and Latin America to Poland is in rising trend, and at the same time Poles are emigrating from Poland to the west. As migration rises, one can notice changes in the local labour market. In Poland, the labour market has seen a rapid expansion of temporary work agencies, primarily in low-skilled employment sector such as manufacturing, construction, harvesting and logistics and high-skilled employment sector as well such as finance, accounting, and information technology.

These employment agencies play pivotal roles in facilitating hiring process for companies and act as intermediaries between employers and employees. When such agencies are playing significant roles in facilitating employment processes, several agencies are taking advantage of loophole in system and migrant vulnerable employees. Common practices of not declaring work beyond the legal minimum hours and wages were seen among several employment agencies. Such activity is essential to research, model and design appropriate policy to maintain effective labour market.

The Dual Labour Market Theory (Harrison & Sum, 1979) posits the existence of two labour market segments: the primary segment which offers secure, highly paid jobs with job security as well as social security, and the secondary segment, which is characterized by low wages, lower job security and limited career progression due to lack of skills. Employment agencies often facilitate growth of this secondary segment by providing flexible labour to employers while transferring risk to employees. The shadow economy, particularly in under-declared work, thrives in this secondary segment since regulatory oversight is weak and labour is easily replaceable as they do not pose highly demanded skills.

This study address declared, undeclared, and partially declared employment in Poland and further focuses mainly on partially declared employment and its impact on fuelling the shadow economy in macro level. Possibly due to difficulties to get data for partial-formal employment or the nature of such activities, very small numbers of research were conducted in such field. Existing research has generally focused on widely known broad areas of the shadow economy forgetting small level of issues which might have substantial negative impact in fiscal revenue. This research attempt to find mentioned partially declared employment, estimate fiscal loss, analyse the displacement effects of undeclared work on employment opportunities, and discuss and recommend regulatory and policy responses to address these issues.

2. Literature Review

The determinants of the shadow economy depend on region, sector of industry and taxation in such sector. However, researchers have identified several recurring factors. González-Fernández & González-Velasco (2015) followed the Currency Demand Approach and conducted an analysis on shadow economic activity in Spain utilizing annual data from 1987-2010 and found that personal income tax is the primary factor in driving shadow economic activity. In other words, tax is a significant influence on informal economies. As personal income tax burden increases for formal income, the incentive increases for workers and

employers to enter informal arrangements. The findings of Gonzalez-Fernande and Gonzalez-Velasco are confirmed by Remeikiene et al. (2018) who used the MIMIC model for informal economy in Lithuania in the years 2012-2016, and found significant links to population incomes and tax foregone as an influencing factor on levels of informal economic activities. Their study also identified population structure, particularly youth employment and urban-rural social differences, as neutral characteristics, that fully explain which labour will be informal.

Vorobyev (2015) and Davydova et al. (2020) found that informal economic activities are not only prevalent in many regions of Russia, but local authorities encourage or permit informal economic activities because they create short-term financial gains. Davydova et al. (2020) also contend that informal economy behaviours are driven by state tolerance, inadequate regulation, and weak enforcement.

Williams & Horodnic (2017) investigating data from face-to-face surveys conducted in 28 EU member states using multilevel logistic regression, found that informal work generally arises from behavioural factors instead of purely economic rationalities. They found that informal work was prevalent because of low perceived penalties, reduced chances of being detected, and low tax morale.

These studies lead to some broadly similar factors being identified in the shadow economy, that is tax and contribution burdens; demographic vulnerabilities, aspects of institutional weakness, and the accepted behaviour of sprouting informal work practices. The findings from Lithuania, Russia, Spain, and Ukraine converge despite the national differences providing fertile ground for informal work to persist, multiple systems inadequately founded in law, managing informal work and contributing to the informal burden on the economy.

This research literature supports the theoretical model of the research and its framework which uses rational actor theory and dual labour market theory, to account for partially declared work in Poland. There is evidence that the formal contracts from the employment agency are the legal shell under which undeclared work flourishes. In the case of Poland, informal work is not only a soldier's survival method but also profit maximization for agencies operating without consequence.

3. Methodology and Data

To understand and estimate the level of shadow economy in employment sector, quantitative survey-based research is designed. A quantitative approach is suitable for the research with this nature to evaluate, estimate and forecast the fiscal losses it causes.

The research design combines both, primary survey data and secondary survey data from European data. Primary data is collected initially via online survey and due to insufficient response, on-site survey was conducted visiting workers dormitory in Katowice and surrounding areas. Secondary data were extracted from European data platform which is available in web portal (www1). The secondary data which is called 'Special Eurobarometer 498: Undeclared work in the European Union' contains survey data from countries in European Unions, and it investigate the perceptions and participation in undeclared work.

To fulfil the quantitative aspect of this study, a structured survey was conducted to gather primary data from individuals working in low-skilled labour market. Survey participation was entirely voluntary, and confidentiality was emphasized throughout the process. Respondents were assured that no personal information and any identifiable information would be collected and analysed. Majority of the questions were in multiple-choice format to ensure the ease and uniformity of the response. Survey also includes open-ended questions to gathers the qualitative insights and perceptions of workers. Structure and wording of such questions were carefully neutral to avoid discomfort among workers. The survey was first intended to be an online survey, but due to low respondents, the survey was conducted in a more field visit approach. It was completed over a period of approximately 3 months, from February to April 2025, targeting workers' dormitories in Katowice and its nearby areas. The survey respondents were mainly workers in four major industries as presented in Fig. 5.

Due to language barrier, and unwillingness to participate, low skilled native Polish workers were not included. The survey respondents were migrant workers from Asia, Eastern Europe, and Africa, with a small representation from Latin America. The survey included mainly questions about access to employment contract, contracted work hours, actual monthly working hours, the payment method of salary, access to insurance, and related topics. In total, 82 valid responses were collected. As there was a small sample size and all workers shared a workplace, responses regarding working hours, and a lot of the other data, had low variation.

While the data does not have much diversity, it still points to informal economic activity in the labour market. Although the data did not have enough diversity to be statistically significant, the survey results provide valuable insight into the shadow of informal economies and overtime hours. Specifically, 95% of respondents indicated they worked some hours above those formally declared, with those extra hours paid in cash. The variability in extra overtime hours across industries was consistent. While this was a limitation of study possibility, selection bias existed because only workers who wanted to participate were surveyed.

Model wise, MIMIC (Multiple Indicators Multiple Causes) model is considered ideal model to study shadow economy. It is widely used by Friedrich Georg Schneider in his research of shadow economy (Buehn & Schneider, 2008; Dell’Anno & Schneider, 2009; Enste & Schneider, 2000; Medina & Schneider, 2017; Schneider, 2011). The MIMIC model has become a foundation in shadow economy research due to its ability to estimate unobserved informal activity through observable variables. Williams & Horodnic (2017) use multi-level regression to study behavioural factors of informal economy. Here regression model is presented to estimate the amount of lost public revenue from undeclared wages and partially declared wages, below model was created.

$$Y_t = \beta_0 + \beta_1(H_{un,t} \times W_t \times \tau) + \varepsilon_t \quad (1)$$

where

- Y_t = Estimated loss in public revenue per person.
- H_{un} = Number of hours worked without declaration
- W_t = Hourly wages rate
- τ = Combined contribution rate (Social security, health insurance and tax)
- ε_t = Error term

Błąd! Nie można odnaleźć źródła odwołania. is simple linear regression to estimate the fiscal loss per individual due to undeclared extra hours of work. The dependent variable is the total amount of unpaid income tax and social contribution, while the explanatory variable is the product of the number of undeclared hours in excess to what is declared, hourly wages rate and combined contribution rate. The coefficient β indicates the fiscal loss per undeclared hour.

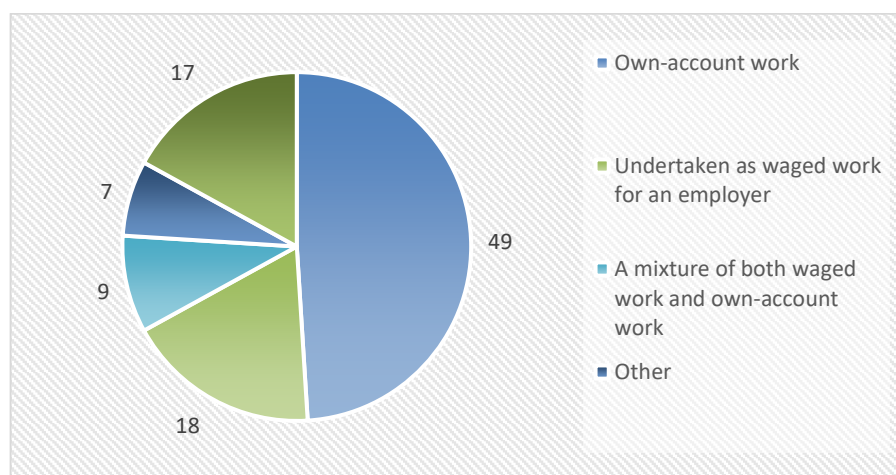
4. Analysis and Findings

The attempts to measure, evaluate and estimate the size of the informal employment and its impact on shadow economy overall is slightly complex because of the nature of topic. As like the definition, such transactions and activities occur in the shadow, a side from the sunlight of public authorities. Not having proper accounting and reporting of such transactions, one can ask how it can be measured and estimated their scope. In this scenario, comprehensive survey plays a pivotal role in information gathering, support to analyse them, and estimate the size and scope of it.

Eurobarometer survey was conducted focusing undeclared work in the European Union in 2019 and published in 2020. Some analysis parts of the survey from Polish labour market were borrowed to conduct this study.

To understand the Polish labour market and existence of informal economy it is essential to study about the nature of undeclared work in Poland. As shown in Fig. 1, 18% of respondents reveal they have worked undeclared for their employers. Similarly, 9% reveal that they work for wages without declaring for their employers and for themselves. The majority of respondents (49%) mention only their own works were not declared. As this being sensitive topic, there might be a chance of underestimating the actual amount of underdeclared work.

Fig. 1 Nature of undeclared work (in %)



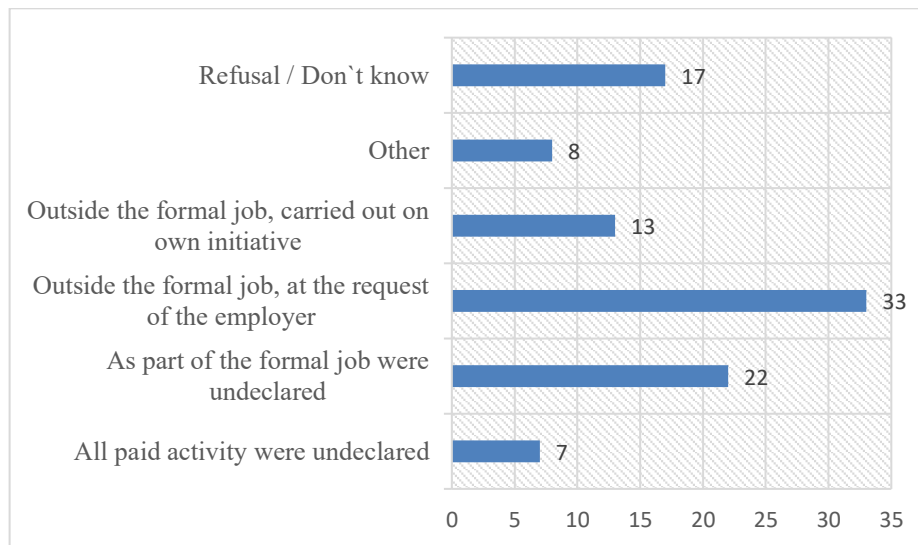
Source: Based on data from Special Eurobarometer 498 (Wave EB92.1, 2019)

What is the proportion of declared work and undeclared work? This might be important questions to get answers as this can directly let researchers estimate the fiscal loss.

Fig. 2 shows the level of undeclared work in Poland, where 7% of respondents reported that their entire paid activities are undeclared. This percentage is relatively high considering Poland as emerging economy with the highest numbers of active working population. 22% of respondents reported that their formal job is not declared. And 33% of respondents work informally outside of their formal job and it is at the request of the employer. Does this data represent the actual scenario? A study conducted by Arezzo et al. (2024) using Eurobarometer survey 498 using a Probit model with correction for misclassified cases (i.e. those undertaking undeclared work but declaring that they do not) found that almost a quarter (23.3%) of the respondents undertaking undeclared work failed to openly admit this during the survey because

of social desirability bias. Which indicates that informal employment is wider than we anticipated.

Fig. 2 The extent of undeclared activity in participants overall paid activities (in % , 2019)



Source: Based on data from Special Eurobarometer 498 (Wave EB92.1, 2019)

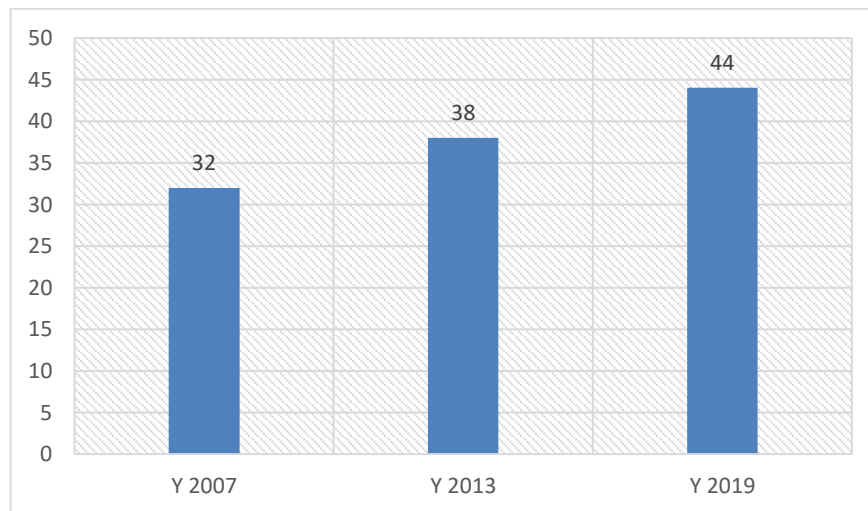
Estimating total public revenue loss based on data presented in Fig. 2 and assuming such percentage as representation of overall informal employment in Poland. To estimate the scale of pure undeclared employment, two elements can be taken from the Fig. 2; (1) percentage of labour force whose entire paid activity were undeclared (7%), and (2) whose formal jobs were undeclared (22%) and it gives 29% of employment working without declared. Together, it gives 5.17 million of labour force working entirely undeclared (29% of 17.8 million as per Labour Market Information, 2023 (www2)).

To estimate the revenue loss, one can assume that individuals who are completely undeclared (5.17 million) are working 160 hours a month, while not paying taxes or social contributions. Under conservative assumptions of average wage and tax rates (Tab. 1), this gives us a loss of 7.3 billion PLN in revenue loss in a month. When annualised, this loss of public revenue would be close to 88 billion PLN.

While it is important to highlight that this revenue estimate is more of a rough estimate rather than a precise figure due to the differing amounts of undeclared earnings from individuals in different sectors and the potential for double counting, however, it does highlight the significant economic implications that informal employment has on Poland's tax base.

Future work that could leverage more granular data would represent a significant refinement in our estimations above, but nonetheless, the findings above provide further impetus for more effective enforcement and policy alternatives that could assist in reduce tax evasion.

Fig. 3 Detection risk for engaging in undeclared work (in '%')



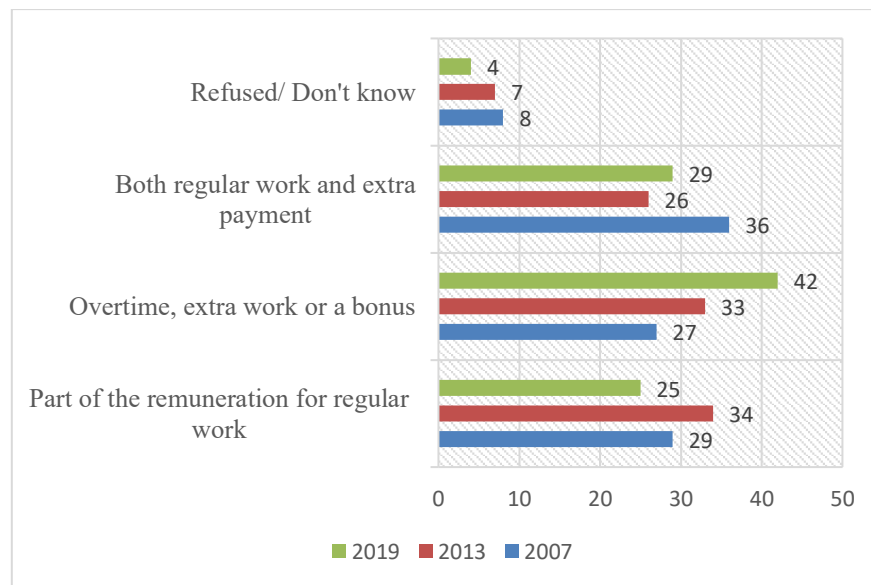
Source: Based on data from Special Eurobarometer 284 (Wave EB67.3, 2007), 402 (Wave EB79.2, 2013), 498 (Wave EB92.1, 2019)

One of the key solutions to minimize the informal employment is frequent monitoring and regulating labour market. Then the question comes if there is detection risk? What are the consequences once it has been detected? Does a penalty surpass the benefit of not declaring work and saving social contributions and tax? In such case, individual can make decisions by comparing the expected benefits and expected cost of action in form of penalties. If the perceived benefit outweighs the cost, they might choose to act even though it is against the rule. Fig. 3 illustrates the perceived risk of being caught when engaging in informal employment is slightly high in 2019 (44%) from 2007 (32%).

Fig. 4 shows the percentage of working population receiving ‘envelope wages’, wages paid in cash in European Union. These transactions don’t directly represent the informal payments but illustrate the amount of cash transactions. 42% of respondents received overtimes, extra hours or a bonus in a form of cash transaction, while 29% of respondents received all wages via cash, and 25% received part of the remuneration for their regular work via cash. This result might help to understand the level of ease of payment made in cash, behaviour towards paying in cash and receiving in cash. As cash being complex to trace, acceptability, and nature

of being liquid, there can be no issue for one to receive payment on it. Then a question arise that does such payment are made on purpose to avoid tax and social contribution? Or there can double tax benefit from it, such as a restaurant receive payment for food via cash, it wasn't reported in income account and portion of it was paid to staffs, avoiding restaurant income tax and tax and social contribution for employee. This data quite closely aligns with my survey data which will be present in next section.

Fig. 4 Envelope wages: remuneration and proportion of income paid cash in hand (In '%', EU Average)



Source: Based on data from Special Eurobarometer 284 (Wave EB67.3, 2007), 402 (Wave EB79.2, 2013), 498 (Wave EB92.1, 2019)

Eurobarometer survey represents the wide area of shadow employment in Poland, and it shows the overview of its existence and help to understand the glimpse of it. In general, the existence of informal employment, fully or partially declared work is observable in Poland, and there is no doubt that it is expanding.

Fig. 5 shows that average of 231 hours of work monthly is performed by a worker working in food processing industry while he is formally declared for only 160 hours of work. Similarly, on average 236 and 232 hours of work were observed in manufacturing and logistic industry. The observed average hour of work is 225 hours, which is 65 hours more compared to the declared work. And such hours of work represent the approximately 44% of undeclared hours.

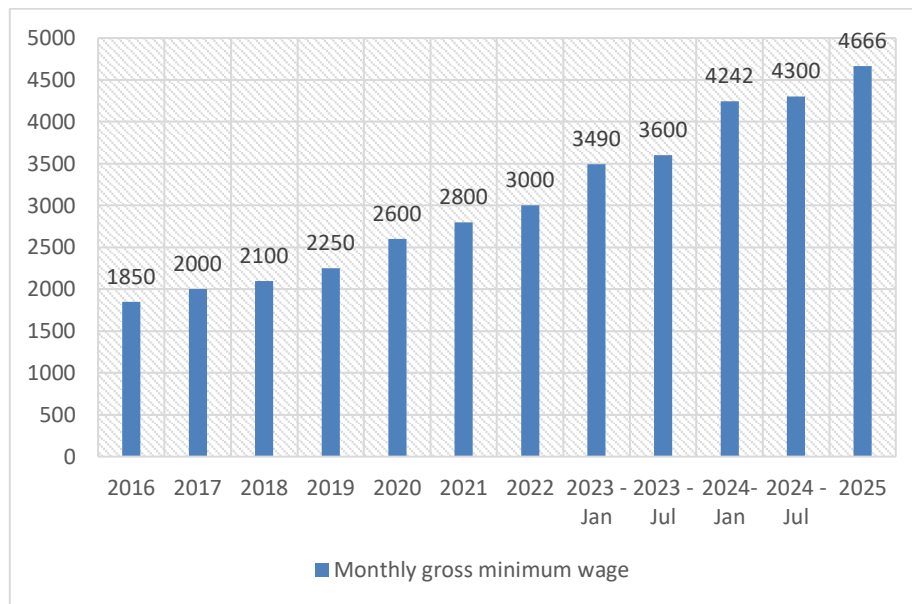
Fig. 5 Average hours of work per person in each sector



Source: Own calculation based on survey

Minimum gross salary is set annually by the Polish government, and it serves as a legal benchmark for the minimum required salary threshold. Fig. 6 gives the glimpse of historical data of minimum gross salary. It can be observed that the salary has doubled in 2025 when compared to 2019. It is the impressive improvement in labour market, and both employees and the government benefit from them. It helps government to accumulate larger amounts of fiscal revenue. But as talking about informal employment, such increases in minimum salary thresholds also increase the opportunity for agencies to grasp higher profits.

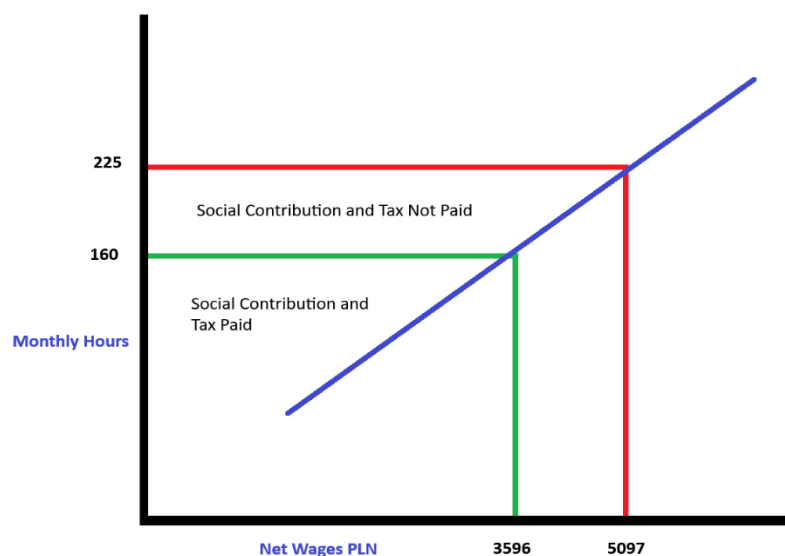
Fig. 6 Monthly gross minimum wage



Source: www2

Based on Fig. 5 data of average hours of work performed, below in Fig. 7 one can observe the estimated share of the shadow economy which lies between the minimum net salary and the actual salary paid to workers. To support this graphical representation, **Błąd! Nie można odnaleźć źródła odwołania.** present a theoretical estimation framework for calculating the fiscal revenue loss per person working in informal labour market.

Fig. 7 Estimated graphical overview of shadow economy



Source: Own design based on survey data

What can be the value of unpaid social contributions and tax amount? It was estimated of 8.94 PLN (Tab. 1, D + E) per hours of work, and as per the average hours per person (225 hrs); unpaid social contributions and tax can be estimated to 581.10 PLN (Average undeclared hours * per hour tax and social contribution) per person per month.

Tab. 1 Salary and it's component calculation

Title	Monthly (160 Hours)	Per Hour
Gross Monthly Salary (Y)	4666.00	29.16
Pension Fund (A)	455.40	2.85
Medical Insurance (B)	114.32	0.71
Health Contribution (C)	368.67	2.30
Social Contribution(D) (D= A+B+C)	938.39	5.86
Tax (E)	492.00	3.08
Net Salary (Y-(D+E))	3235.61	20.22
Source: https://antal.pl/wiedza/kalkulator-umowa-zlecenie		

Now, from the survey data, potential employment loss due to extra hours of undeclared employment can be estimated . Having in mind that the declared extra hours might also reduce the potential employment opportunities, but as these hours falls under the formal employment, these are not considered for calculations. With assumption of 160 hours of declared work, calculation below estimate that each person working average of 225 hours per month would lose the potential formal employment opportunity for 0.40625 person. This means that for each 2.46 (=1/0.40625) such workers, one potential formal employment is effectively lost. It shows that the undeclared employment not only impacts the fiscal revenues but also reduces the potential employment opportunity for another person.

$$\begin{aligned}
 Job\ Loss_i &= \frac{(Actual\ Hour - Declared\ Hour)}{160} \\
 &= (225 - 160)/160 \\
 &= 0.40625
 \end{aligned}
 \tag{2}$$

5. Discussion and Conclusions

The results from this study unambiguously confirm the extent of the partially declared labour in Poland's low-skilled labour market, primarily through the practices associated with temporary work agencies. The results from our survey and analysis clearly demonstrate that many workers are employed for considerably more hours than declared and often paid in cash

for those additional hours. The combination of formal contracts and informal practices carries serious implications for fiscal policy, distribution of employability and labour rights for informal workers.

The primary motive for these practices is an economic one. Employment agencies can save large profit margin by declaring fewer hours. Our analysis shows that by only declaring 160 hours (the legal limit of full-time work) and employing workers for 200-250 total hours, a temporary agency saves taxes and social contributions on approximately 40-90 hours per employee. All of this occurs with the agency operating under the "shield" of a formal contract and makes it incredibly difficult to detect through the standard auditing process unless comprehensive auditing is employed to compare declared hours with actual schedules.

Furthermore, rational choice theory and deterrence theory shed light on why these practices are so persistent. The cost associated with getting caught (low sanction $\times$ low likelihood of detection) is lowered by the economic benefit created by underreporting from an agency's perspective. Agencies operate with near-perfect confidence of impunity, effectively playing the system.

A key takeaway from this study was the labour displacement effect. In an example of labour demand of 500 hours, hiring two workers where each worker does a total of 250 hours results in 180 hours of undeclared labour (2×90 hours); however, if they were to hire three workers at 167 hours, only 20 hours would go undeclared. Therefore, the previous scenario maximizes agency profits from a fiscal distortion and diminishes the number of potential employments opportunities. The job that is lost therefore supports the notion that informal labour not only impacts these organizations but also deepens unemployment as well.

In conclusion, this research indicates that the various forms of informal labour practises are structurally embedded in the formal aspects of the Polish low-skilled labour market, based on evidence using data from both Eurobarometers and an original survey undertaken in Katowice. Employment agencies appear to adopt a dual strategy: they formally acknowledge the legal minimum in terms of work; however, they extract disproportionately informal work to avoid obligations. The problem with undeclared work, is that undeclared work hours result in tax and social security avoidance and reduced available work. This contradicts the intention of aspects of labour-market regulation.

6. Policies Recommendation

A multi-dimensional policy strategy will be needed to tackle the issues identified in this research. Labor inspections and audits will have to be greatly enhanced, especially through random inspections, and with data sharing to identify issues in comparing reported and actual hours. The mandatory implementation of digital timekeeping and reporting would also allow authorities to see hours worked in real time and create transparency.

Important element to regulate such activity is higher financial penalty. Each penalty should also have a reputational aspect, for example, prohibiting non-compliant agencies from public contracts. Providing incentives for whistleblowers or legal immunity from prosecution for their disclosures may also be useful as a way to garner disclosures.

Last but not least, awareness campaigns for employers and individuals will be critical for re-establishing and transforming tax morale, as well as to remind everyone of the long-term consequences of informality, loss of pension eligibility, and lack of health insurance for individuals and dependents. These combined efforts will allow the state to get greater handle on the shadow economy, protect public finances, and maintain a fair labour market for all.

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