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Exploring Shadow Economy and the Risk of Poverty in Polish Regions

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Andrzej Buszko[1]

Abstract:

Purpose: *The aim of the research was to indicate the correlation between poverty risk index and the level of shadow economy in Polish regions. The research was conducted taking into consideration 2022. MIMIC approach was employed to set up the level of shadow economy, latent variable was clarified based upon observed factors. Spearman correlation index was used to find out the relationship between analysed categories. Based on the result 0,684, it should have been assumed that there is a high positive correlation between the poverty risk index and the level of the shadow economy in Polish regions.*
Design/Methodology/Approach: *The consideration formed the basis for the formulation of the research hypothesis: There is a relationship between the level of shadow economy and risk of poverty. To verify such a hypothesis, the results of own calculations were used.*
Findings: *The results of the research showed the existence of significant relationships between the selected characteristics that determine appropriate attitudes toward unemployment and the development of the shadow economy.*
Practical Implications: *The obtained research results are of particular importance for the development of appropriate tools towards the shadow economy. The indication of guidelines that may change this state of affairs and the developed research allowed us to identify areas of influence and meet the requirements of regional competitiveness.*
Originality/value: *The obtained research results showed which conditions are most conducive to predicting shadow economy processes. The results obtained will allow public administration to focus on these elements in order to achieve better results in combating the sources of the shadow economy.*

Keywords: *Shadow economy, regions, poverty, indicator.*

JEL classification: *E26, C01, C12, C58, E01.*

Paper Type: *Research study.*

[1]*Pomeranian University in Slupsk, Institute of Management, Slupsk, Poland*
https://orcid.org/0000-0003-0600-4646, e-mail: Andrzej.buszko@upsl.edu.pl;

1. Introduction

The issue of poverty, especially the risk of poverty, is an extremely important social category. It is multidimensional and can be seen as a kind of barometer of the effectiveness of state action. There are many definitions of poverty and the risk of poverty. Most commonly, poverty is considered a situation in which a citizen lacks sufficient resources for a dignified life, distinguishing it from mere subsistence (Zabielska, 2007).

In Poland, a poverty risk index is calculated based on citizens' income, including social transfers. People at risk of poverty are those whose income falls below 60% of the national median disposable income after social transfers. Additionally, a person is considered at risk of poverty if they are unable to perform four out of nine essential activities, such as paying rent or utility bills, heating their home, covering unexpected expenses, eating meat or fish every other day, taking a one-week vacation annually, owning a car, washing machine, TV, or phone (Bąba, 2019).

The Institute of Labour and Social Studies (IPiSS) calculates the subsistence minimum, below which consumption leads to physical deterioration. When only a relatively small group of citizens is at risk of poverty, the state is perceived as effective in solving social problems.

Poverty is a concerning phenomenon in any economic model, but it is especially significant in the model of a social market economy, which Poland follows. This model emphasises addressing pressing societal issues, including poverty and the shadow economy. While much attention has been given to the conditions, effects, and types of poverty, relatively few studies explore the relationship between poverty and the shadow economy. This publication aims to fill that gap.

Poverty, the risk of poverty, and social exclusion arise and persist under various circumstances and may even increase during economic booms (Adams, 2003). It affects different social groups, including young and well-educated individuals (Atkinson *et al.,* 2002). However, it is most commonly associated with single parents, large families, the elderly, and minorities such as the Roma. This issue has received considerable attention in the literature (Breunig and Majeed, 2020; Fosu, 2018).

During economic crises, epidemics, or ineffective institutional governance, the risk of poverty tends to grow (Haines, 2019). In economically underdeveloped regions, the risk of poverty is relatively high, and extreme poverty is more prevalent. In Poland, such regions include the so-called eastern wall: Podlaskie, Lubelskie, Świętokrzyskie, and Warmian-Masurian voivodeships (GUS, 2023).

The shadow economy is also viewed as an indicator of government effectiveness in addressing exclusion and poverty, necessitating reforms and the creation of a

conducive economic environment. When these efforts are flawed, the shadow economy expands dynamically (Schneider and Williams, 2013).

There may be a close link between the shadow economy and poverty, especially the risk of poverty. Individuals with low or no official income are often forced to seek alternative sources of earnings. The shadow economy offers such opportunities due to its multidimensional nature and various forms. Thus, a relatively large group of people can find temporary or permanent employment within it.

Certain economic sectors traditionally have a significant share of the shadow economy, and workers in these sectors often report low incomes. These sectors include agriculture, construction, non-financial services, gastronomy, and tourism.

Due to the significant socio-economic disparities among Polish regions, there is considerable variation in both poverty risk and the scale of the shadow economy (Danowska-Prokop, Pawlas, and Czornik, 2022). Moreover, the shadow economy, like the legal economy, can generate substantial income.

Some participants in the shadow economy may seek to maximise their earnings while officially remaining at risk of poverty, a situation potentially reinforced by social transfers. If state support for the poor is relatively high and shadow economy work is available, the combined income of such individuals may exceed that of legally employed persons.

2. Literature Review

Aziz *et al.* (2020) conducted research on the shadow economy and poverty levels. They analysed macroeconomic conditions in over 100 countries between 1991 and 2015 and found a strong influence of poverty levels on the size of the shadow economy. The greater the poverty, the larger the shadow economy. They also demonstrated that institutional quality, especially ineffective government policy, contributes to this situation. They concluded that the shadow economy receives a strong stimulus for growth in the presence of flawed institutional governance.

Buehn (2012) examined the scale of the shadow economy in German regions. He observed that citizens' income and purchasing power influence the size of the shadow economy. The higher the income and purchasing power, the smaller the shadow economy. This explained the disparities in shadow economy size across German regions. Regions with high GDP per capita and well-developed economies had smaller shadow economies than peripheral regions. For example, the shadow economy in Hoyerswerda (Kreisfreie Stadt) was 18.4%, while in Erding (Landkreis) it was 12.4% (Buehn, op. cit.).

Zhanabekov (2022) highlighted the widespread interest in the shadow economy due to its universal presence. It exists in every country and region, differing only in scale.

Therefore, it is relatively easy to find employment within it while officially declaring low income (Grima *et al.,* 2024).

Hassan and Schneider (2016) emphasized that regions with high unemployment, low GDP per capita, and high inflation tend to have large shadow economies. Johnson *et al.* (2017) demonstrated a link between corruption levels and the shadow economy. The larger the shadow economy, the greater the corruption. This relationship has significant socio-economic consequences. For example, southern Italy is perceived as a region with high corruption, unlike the north, which is economically more developed and characterized by dynamic investment, including foreign investment (Guarnieri, Dallara, and Sapignoli, 2020).

Lyulyov *et al.* (2021) found that a 10% increase in foreign investment leads to a 0.5% reduction in the shadow economy. Regions with high foreign investment inflows should have relatively smaller shadow economies.

Abdih and Medina (2013) concluded that a rigid labor market contributes to the size of the shadow economy. The lack of flexible employment forms increases the tendency to work in the shadow economy.

Gyimah and Saunori (2025) analyzed U.S. states regarding occupational licensing procedures. In regions with excessive bureaucracy and few licenses granted, applicants (due to lack of alternatives) readily moved into the shadow economy. If they followed regulations, their official income would significantly decrease, affecting their standard of living. In extreme cases, the risk of poverty would be substantial.

Entrepreneurs sometimes support the shadow economy. When a company faces financial difficulties, some employees are laid off to reduce costs but are simultaneously offered unofficial employment. The employer avoids paying mandatory contributions, significantly lowering employment costs (Chen *et al.,* 2023).

Sanyal and Bhattacharya (2009) refer to theories emphasizing the close link between the labor market and the shadow economy. According to them, the legal economy cannot offer employment to all interested individuals. Those who remain unemployed quickly deplete their financial resources, become impoverished, and consequently seek any income in the shadow economy.

Referring to dual labor market theories (Doeringer and Piore, 1971; Saint-Paul, 1997; Grecu *et al.,* 2024), a permanent division is identified between the primary and secondary legal markets, as well as illegal and informal markets. The latter two can be classified as part of the shadow economy.

Godfrey (2011) and Maloney (1999) use the term "peripheral shadow economy," referring to small firms, especially self-employment, based on extensive labor resources. They employ individuals without special training or education who are

satisfied with minimal wages. This results primarily from a lack of alternatives and often extreme poverty.

In the context of the shadow economy, poverty should also be considered a traumatic experience, difficult to overcome. Poverty and trauma are interdependent phenomena (Lerner, 2019). The inability to earn income deepens this situation (Mountz, 2017). Therefore, the shadow economy may not only limit the extent of poverty but also reduce the risk of trauma.

Bithymitris (2023) emphasizes that poor individuals experiencing trauma due to their economic situation struggle to regain full health. Such trauma leaves a lasting mark. Cruz (2023) highlights the behavior of people who have escaped poverty. They strive to avoid returning to their previous situation and seek various forms of employment. They do not sever ties with the shadow economy, as the contacts made may prove useful again.

Arendt, Grabowski, and Kukulak-Dolata (2019) presented an interesting view on shadow economy employment in different Polish regions. In well-developed regions, young people most often choose shadow economy work. In less developed regions, shadow economy employment is more widespread and affects virtually all social groups.

The risk of poverty in Poland varies significantly—not only between regions but also among social groups. The most at-risk are residents of the eastern wall, especially Podlasie, Warmia and Mazury, and Lublin regions. In 2022, the extent of extreme poverty among people living off non-wage sources was 14.8%, among farmers 11.8%, and the lowest among self-employed individuals 2.9% (GUS, 2023).

3. Materials and Methods

The research adopted two objectives: a primary and a secondary one.

- The primary objective was to determine the relationship between the poverty risk index in individual Polish voivodeships and the size of the shadow economy.
- The secondary objective was to estimate the level of the shadow economy in Polish voivodeships.

The following hypothesis was formulated:

There is a positive correlation between the level of poverty and the shadow economy. The study covers the year 2022. Data on the poverty risk index were obtained from the publication by Statistics Poland (GUS) titled “Poverty in Poland in 2021 and 2022.” This index is calculated based on three partial measures:

1. Poverty risk index (after accounting for social transfers),

2. Index of severe material and social deprivation,
3. Index of very low work intensity (GUS, op. cit., p. 66).

The size of the shadow economy was calculated using the MIMIC approach (Multiple Indicators Multiple Causes). This method was chosen because the shadow economy is a phenomenon that cannot be directly measured. It is estimated based on the determination of a so-called latent variable. The concept of Structural Equation Models (SEM) is used to establish the influence of measurable variables on the estimated variable (in this case, the latent variable, i.e., the shadow economy).

Structural equations take the form of a matrix that includes:

- A vector of exogenous variables (known, measurable data),
- Structural parameters, and
- Measurement errors.

It was noted that structural and measurement errors are independent, and their distribution is based on constant variance.

The known and measurable variables considered for each voivodeship included:

- Unemployment rate,
- Crime rate,
- Level of investment,
- Consumption,
- Average wages,
- Prices of goods and services,
- Share of agriculture and construction in regional GDP,
- Number of small and medium-sized enterprises.

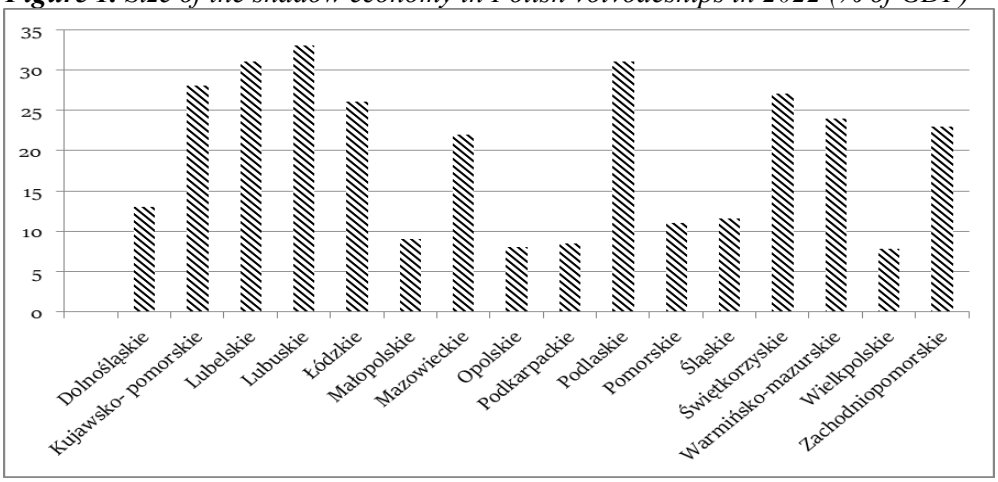
The shadow economy was expressed as a percentage of regional GDP. Time series stationarity was considered using the Augmented Dickey-Fuller (ADF) test. In order to measure the relationship, the Spearman correlation coefficient between the ordinal variables was calculated. Then, the strength of the relationship between the nominal and ordinal variables was measured using chi-square tests. The limit of statistical significance was $p < 0.05$.

3. Research Results and Discussion

The theoretical considerations were verified by an empirical analysis carried out according to research sequences based on the findings resulting from the answers to the questionnaire. The first stage (stage I) of the analysis involved processing the obtained data. Then the hypothesis was verified (stage II) and compared with the theoretical part of the obtained material. Stage III presents the final conclusions and suggestions on how to prevent the development of shadow economy practices.

In accordance with the adopted methodology, Figure 1 presents the size of the shadow economy in individual Polish voivodeships in 2022.

Figure 1. *Size of the shadow economy in Polish voivodeships in 2022 (% of GDP)*



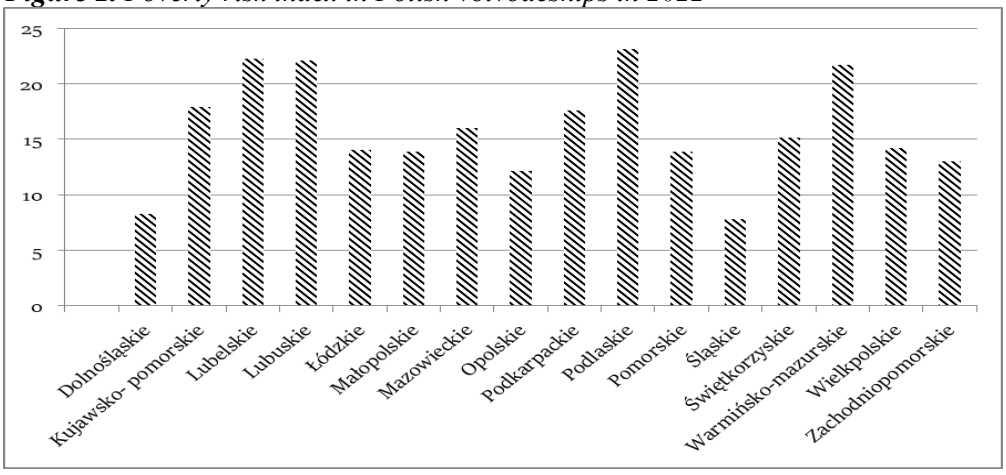
Source: *Author's own calculations.*

In 2022, the highest level of the shadow economy was recorded in:
- Lubelskie Voivodeship – nearly 33%,
- Kujawsko-Pomorskie and Podlaskie – approximately 31%.

The lowest level was observed in:
- Wielkopolskie Voivodeship – just under 8%.

Relatively low levels were also noted in:
- Małopolskie, Opolskie, and Podkarpackie – all below 10%.

Figure 2. *Poverty risk index in Polish voivodeships in 2022*



Source: *Statistics Poland (GUS, 2023), "Poverty in Poland in 2021 and 2022".*

In 2022, the highest poverty risk index was recorded in:
- Podlaskie Voivodeship – 23.4%,
- Lubelskie – 22.6%,
- Warmińsko-Mazurskie – 20.6%.

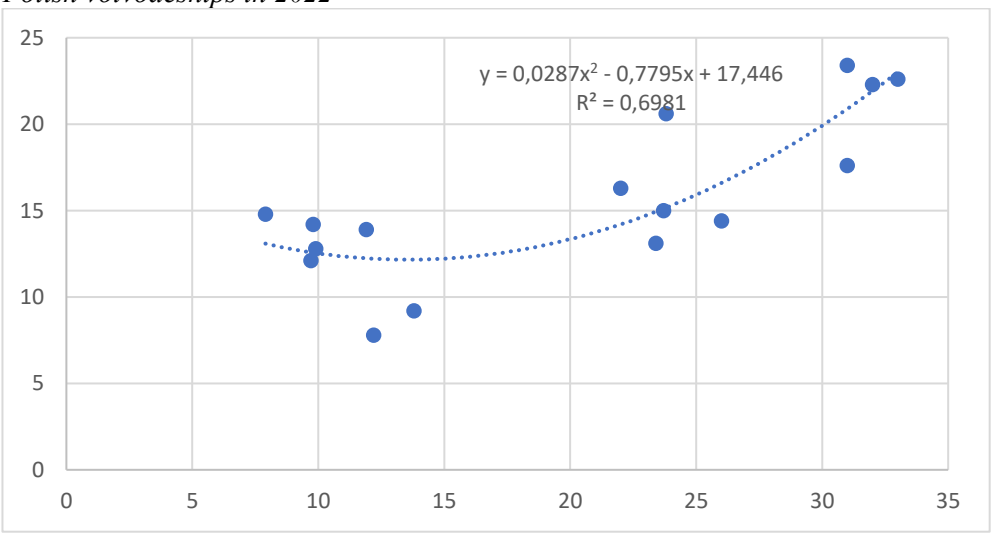
The lowest values were observed in:
- Śląskie Voivodeship – 7.8%,
- Dolnośląskie – 9.2%.

Additionally, 2022 saw high inflation at 14.4%, which contributed to the lack of growth in extreme poverty.

Using Spearman's correlation coefficient, the relationship between the size of the shadow economy and the poverty risk index across Polish regions was determined. The coefficient reached a value of: 0.684 ($p < 0.1$). Based on this result, a positive correlation between the size of the shadow economy and the poverty risk index in Polish voivodeships can be confirmed. The strength and direction of a monotonic relationship between two ranked variables, making it useful for make a conclusion that the higher the poverty risk index, the larger the shadow economy**.**

On the other hand, the results of the research presented in this article need to be examined using another research aspect in the field of the shadow economy through regression analysis, which predicts the value of a dependent variable (level of shadow economy) from other independent variables (poverty level) and can establish a functional relationship between them, often assuming a linear or other specific form.

Figure 3. *Relationship between size of shadow economy and poverty risk index in Polish voivodeships in 2022*



Source: *Author's own calculations.*

Summarizing the above research results as well as considerations and research presented in the source literature, it follows that the impact of the above-mentioned poverty level on level of shadow economy may be different and have a different scale of impact force. The indicated significant relationships, which were discovered in the study, confirm the conclusions known in the subject literature.

Therefore, it must be said that poverty level definitely pushes the shadow economy spiral where tax evasion and underground economic activity increase, eroding the tax base, leading to higher deficits, which pushes the unemployment rate.

5. Summary

The issue of managers' attitudes towards creativity and their impact on the development of creative organizations is of great importance for the development of both management theory and practice. Based on the research framework established in the course of the analysis of the subject literature, an identification of the attitudes of managers related to creative activities was made, and then in the course of a statistical analysis of data obtained thanks to the conducted survey, the relationships between selected attitudes presented by managers and the performance of creative activities in the organization were examined.

The analysis of the obtained results allowed us to determine which attitudes of managers are positively and significantly correlated with specific creative activities, thus the hypothesis presented in this article was positively verified.

It should be emphasized that the attitudes significantly correlated with the largest number of creative activities are: creating a safe basis for risky behaviors of innovators; being precise, reliable, effective, methodical, disciplined and conformist; care for stability, order, and good cooperation in the process of cooperation with innovators. In turn, the undertaken activities of a creative nature positively correlated with as many managers' attitudes as possible are: feedback activities, positive reinforcement; activities leading to surprising and creative decisions, conditioning the introduction of new things; not routine, indefinite duration of activities.

The research positively verified the proposed hypothesis:

The shadow economy is strongly and positively correlated with the poverty risk index. Poverty risk results from a lack of sufficient and stable income. This issue is particularly prevalent in Polish regions where unemployment is high and persistently above the national average. These regions are also perceived as economically underdeveloped, with a characteristic economic structure.

Sectors such as:
- Agriculture,
- Construction, and

- Non-financial services

have a relatively high share in these regions' economies and provide fertile ground for the expansion of the shadow economy. As a result, a kind of symbiosis emerges between poor individuals, those at risk of poverty, and the shadow economy. These citizens see the shadow economy as a way to increase their income and improve their material conditions.

Consequently, a practical suggestion arises:

Reducing the number of poor and poverty-threatened individuals will lead to a reduction in the shadow economy.

The shadow economy is a barrier to socio-economic development. Its reduction—especially in economically weaker regions—can generate a positive development impulse and help narrow the gap between these regions and more developed ones, such as:

- Wielkopolskie,
- Dolnośląskie,
- Śląskie, and
- Mazowieckie.

Certain limitations should be taken into account in the context of the study performed. First of all, the research did not predict the value of a dependent variable (level of shadow economy) from other independent variables (poverty level); therefore, the obtained results need to be reshaped by using additional variables.

The described limitation is the starting point for determining further research directions. The obtained research results do not exhaust the issues discussed in the article but constitute an introduction to further research and analysis.

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