

**Andrzej Buszko** ✉

Faculty of Economy  
Warmia and Mazury University Faculty of Economy

## The regional differentiation of shadow economy in Poland – the potential impact for development

**Abstract:** The aim of the article was to measure the level of the shadow economy in the regions of Poland. The MIMIC (Multiple Indicators Multiple Causes) approach was applied. The findings show substantial differences of shadow economy in Polish regions. The highest level of shadow economy in 2016 was identified in Świętokrzyskie (32% of local GDP) while the lowest one was observed in Kujawsko-Pomorskie and Wielkopolskie (23% of regional GDP). The regional differentiation in Poland is quite big economic problem which may harm further economic development. The different efforts that have been implemented did not reduce the dissimilarities. The shadow economy seems to be important structural barrier hampering economic development in Polish regions.

**Key words:** shadow economy, regions, factors, impact, development

**JEL classification:** O17, C39, H26

### Introduction

Interest in the shadow economy has recently been rapidly growing in the public, not only among academics, politicians, social scientists, but managers as well. This is mainly because shadow economy exists in any country and just varies according to its level and category. The size of the shadow economy depends on the state and official measurement approach applied in each particular case [Braude 2005]. The shadow economy – that is, underground plus self-service economy – has been growing both in nominal and in real terms much more rapidly than the respective official economy in Western industrialized countries from the 1970s [Cassel 1984]. Such situation was identified especially by 1990s [Schneider 2013]. Moreover, the legal

---

Andrzej Buszko <https://orcid.org/0000-0003-0600-4646>

✉ buszko@uwm.edu.pl, UWM, WNE, ul. Oczapowskiego 4, 11-041 Olsztyn

economy performance cannot be explained without considering shadow economy activity.

Shadow economy is defined as the ensemble of all market-based legal production activities that are deliberately concealed from public authorities for one or more reasons: to evade payment of income tax, value added tax or other taxes; to evade payment of social security contributions; to evade certain legal labor market standards, such as the minimum wage, maximum working hours, safety standards, etc.; and to evade certain administrative procedures, such as completing statistical questionnaires or administrative forms [Schneider et al. 2010]. On the other hand, in an abstract economic context, the shadow economy can be viewed as a specific market “anti-institution”. In this light it can be claimed that the shadow economy can eliminate tax and other wedges that institutions create between labor supply and labor demand or product supply and product demand, thereby creating employment or products that would otherwise not have been created, and extending the cost-effectiveness margin for both individuals and businesses. In a hypothetical market free of taxes and other costs associated with the running of institutions, all economic activity is ‘in the shadow’. In reality, formal and informal economies exist in parallel, which introduces distortions and allocates resources sub-optimally [Arandarenko 2015]. In many cases, shadow activities are not even prohibited by law if, for example, they can be declared as neighborly help.

In many countries black work cannot be even punished as long as it cannot be proved that it is undertaken on a “considerable scale” with the “sole goal of making a profit”. That is why effective limitation of the shadow economy sometimes is extremely very difficult.

The methods usually applied to estimate the shadow economy may be divided into direct and indirect approaches. Direct methods are based on contacts with or observations of persons and/or firms to gather direct information about undeclared income. There are two their types: the auditing of tax returns and surveys. Indirect methods try to determine the size of the hidden economy by measuring the “traces” it leaves in the official statistics. They are often called indicator approaches and use mainly macroeconomic data. Such methods can be divided into six categories: (1) the discrepancy between national expenditure and income statistics; (2) the discrepancy between the official and real labor force statistics; (3) the transaction approach; (4) the currency demand (or cash-to-deposit ratio) approach; (5) the physical input (e.g. electricity) method [Dell’Anno et al. 2007].

The effects of the shadow economy are numerous and important, but they are not unequivocal. Moreover, the opinions are often contradicted. Based on many researches it should be stated that shadow economy reduces government revenue and distorts official indicators (economic growth, unemployment, income distribution, etc.), thereby influencing public sector decisions, producing changes in individual incentives and remuneration factors. In other words, the increase in size of the

shadow economy leads to a significant decrease in tax revenues and to worse public goods provision, that, in turn, can obstacle economic growth. But from the other hand, shadow economy provides opportunity for entrepreneurs since the low cost entry to business activity [Schneider and Enste 2000] It is very important to note that at least two-thirds of the income earned in the shadow economy is immediately spent in the official economy, thus having a positive effect on the official economy [Schneider and Pöll 1999]. So taking this assumption into an account, it can be stated that shadow economy is an important factor fostering budget revenue for affecting VAT turnover. Additionally, shadow economy provides some income for those suffering from low material status and consequently they do not need so much government support. Thanks to that budget deficit can be lowered. Working in the shadow economy may consist of a second job after (or even during) regular working hours; the second form is work by individuals who do not participate in the official labor market; the third form is work by people (e.g. clandestine, social fraud, or illegal immigrants) who are not allowed to work in the official economy [Schneider and Enste 2000]. Companies operating in the shadow economy exert pressure on the legal entities, and they should be more innovative and entrepreneurial in order to achieve market advantage [Adam and Ginsburgh 1985, Wulf and Wenig 1985]. It is needed to remark that relationship between causative features and the shadow economy are endogenous and it is very difficult to find which one is causality of other one. For a longer run, shadow economy harms quality of public institutions and social development [Teobaldelli 2011].

In some countries (especially low developed ones) the shadow economy remains only one choice for activity which does not violate law rules so much. It is regarded as a “safe pillow” for all people aware of their own acts. They do not have simply any other realistic choice except working in the framework of the shadow economy. Finally, shadow economy is, in a way, some barrier for more dangerous form of motion like criminal acts: frauds, murdering, robberies, etc.

### **The roots of shadow economy in Poland**

The shadow economy has a long tradition in Poland. It appears in any activity. That is why this economic phenomenon is familiar not only to business circles, politicians and academics but also to households. Typically, the shadow economy is coined with former economic model – centrally planned economy. Since its mechanism, it gave good background for shadow economy development. In 1989 (as an effect of the centrally planned period), the national economy was inefficient. There was a large power distance between authorities and citizens, and the Communist Party as well as the Government had low levels of trust. The products and services were of low quality, and the market demand was always higher than supply. This was

especially true in relation to consumer goods. Although, the products were of poor quality, the market was affected by a high rate of inflation. In 1989, the inflation rate was at the level of 340% and was sharply heading towards hyperinflation. The budget deficit consisted of 3% of GDP. Within the structure of the GDP, the dominant role was played by heavy industry (coal mines, steel mills, machinery and so on). The services made up only 6% of GDP, at least 6 times less than in West European countries. In 1989, foreign debt was calculated at the level of 42 billion USD. Poland started to borrow money on a large scale in 1970, but the majority of this sum was wasted. Only 20% of this amount was invested, the rest was spent for consumption [Statistical Yearbook 1992]. If the economic model is not efficient, it will not meet the requirements of citizens and companies, and the shadow economy will emerge. The level of the former will increase if the part of requirements is not fulfilled.

According to the different studies going back to 1970, nearly 20% of Polish population lived below the line of absolute poverty [Los and Zybertowicz 2000]. The government could not have taken people out of poverty, so the citizens simply did not have any choice for legal action. They turned their efforts towards shadow economy activity.

The roots of the shadow economy are not just related to the times of the communist regime. One must take into consideration the more distant past. The first inspiration for a shadow economy attitude was during the time of the partitions of Poland. Actually, there were three partitions of Poland. The first was in 1772, the second one was in 1793 and the third one was in 1795. After that, Poland as a large country disappeared from the geographical maps, and was taken over by Prussia, Russia and Austria. However, Poland survived as a nation. The tradition, language, religion, and ethnic norms were kept among Polish families. That time Poles did not accept rules implemented by official governments and illegal activity was widely spread and accepted by the nation. Such attitude created long distance to government and this factor fostered shadow economy significantly. Moreover, it shaped the cultural behavior [Buszko 2019]. Even more, those Polish citizens who did not obey the law were considered to be smart and clever. The period from the independence until the Second World War did not change this attitude very much. The Second World War made a disaster for the nation. More than 5 million Poles lost their lives (including 3.2 million Jews). However, the percentage of scientists, lawyers, doctors, priests, and teachers lost was nearly 35% of their population. Additionally, Poland lost 38% of national assets (compared to 1939), large cities were destroyed (like Warsaw at 85%), and 80% of museums were robbed. Infrastructure was ruined [Beevor 2013]. Taking those evidences into the account, such circumstances seriously affected shadow economy development. I would even state that this “historic complaint” in Poland was and still is an important factor taking into consideration traditional recognized roots of the shadow economy like [Andersen et al. 2007]:

- the level of taxation, and all other social burdens,

- the labor market regulations and unemployment rate,
- a complicated and contradicted legal system,
- the level of corruption and the level of organized crime
- quality of public institutions.

The shadow economy is generally measured on national level. But there are, but relatively less, studies on it related to the regional aspect. Bilonizhko was carried out investigation in 26 Ukrainian and 79 Russian regions affected by the shadow economy [Bilonizhko 2006]. Wiseman examined regional shadow economic activity in 50 US states. Results suggest that tax and social welfare burdens, labor market regulations, and intensity of regulation enforcement are important determinants of the underground economy [Wiseman 2013]. Vorobyev estimated the size of unofficial (informal) sector in 67 regions of Russian Federation using electricity consumption method [Vorobyev 2015]. In Poland the shadow economy has been explored by the Central Statistical Office (GUS), the Ministry of Finance and the Institute for Market Economy Research mainly. Their researches are devoted to the specific roots and effects of shadow economy (like taxation gap) and focus on national level. Due to the following facts there is the need to investigate the shadow economy in Polish regions:

- In Poland there is a large cross-regional diversity in economic development. Considering GDP per capita, the Mazowieckie Voivodeship is the clear leader, then Dolnośląskie, Wielkopolskie, Śląskie and Pomorskie. However, these are Voivodships having large agglomerations with a high level of development. In addition, they have more diverse structure of the economy, much better communication access, richer resources and the quality of human capital, and hence also greater investment attractiveness. In turn, five Voivodships with the lowest GDP per capita are: Podkarpackie, Lubelskie, Warmińsko-Mazurskie, Podlaskie and Świętokrzyskie. These are the so-called voivodships of Eastern Poland, which is characterized by a peripheral location both in the country as well as in the whole EU [Wójtowicz 2016].
- In year 2015 gross monthly wages were the highest in the Mazowieckie province (PLN 4,376), Śląskie (PLN 3,630) and Dolnośląskie (PLN 3,505), and the lowest in Warmińsko-Mazurskie (PLN 2,996), Podkarpackie (PLN 3,025) and Kujawsko-Pomorskie (PLN 3,032) [GUS 2016].
- The highest concern for human capital seems to be represented in the province Mazowieckie (115.9%), Małopolskie (89.5%) and Dolnośląskie (88.6%), and the lowest – Lubuskie (34.1%), Podkarpackie (44.3%) and Warmińsko-Mazurskie (48.2%) [Czapiński 2013].
- Innovation and competitiveness of the economy is clearly concentrated in the Mazowieckie, Małopolskie and Wielkopolskie Voivodships.
- The lowest rate of unemployment is noticed in well-developed Voivodships like Mazowieckie, Małopolskie and Wielkopolskie.

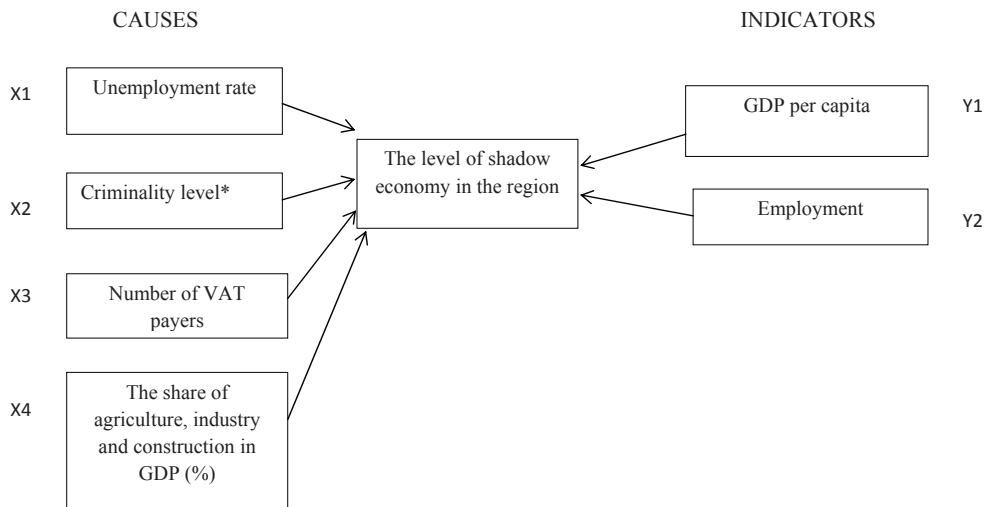
A high disproportion among Polish regions indicates the existence of serious structural barriers. They have not yet been eliminated despite systemic use of public intervention included in the structural funds in the post-accession period. It could be even stated that there is sound of Polish regional division – well-developed ones – located west from Vistula river and less developed ones – situated east from Vistula river. Such situation is durable one. It results in measurable economic effects. The well-developed regions will attract not only well skilled labor force from less developed regions but investments both private and foreign ones as well. Poorly developed areas will be depleted and their proper demographic structure will be lost. Young generation will seek their opportunity somewhere else, but older and retired persons remain. Entrepreneurial culture will decline in poor areas. Agglomeration effects based mostly on clusters, spillover will emerge in well-developed Polish regions. Finally, well-developed regions will integrate more among themselves but less developed ones will stay aside.

Having regard to the above discussion, an interesting research question arises – Does shadow economy perform more actively in less developed regions in Poland or not?

## **Methodological approach**

The goal of the study was to identify the level of the shadow economy in Polish regions. The shadow economy was measured in 2016. In order to do it, the MIMIC (Multiple Indicators Multiple Causes) approach was applied. The measurement was related to percentage of regional GDP. The MIMIC approach is generally widely used in sociology and psychology researches but it proved to be very successful in economics explores as well. It is very comprehensive since the shadow economy affects different activity simultaneously. MIMIC model foresees numerous determinants and for this reason it is very appropriate in this case. MIMIC method was first presented by Zellner [1970] then developed by Joreskog and Goldberger [1975]. The detailed idea of research is presented in the Figure 1.

Taking those data into MIMIC model, calculation were done based upon their robust impact on shadow economy development. Unemployment rate is closely associated with the shadow economy. Generally shadow economy performs as the safe pillow for higher unemployment rate. If there is high criminality level it makes wider space for shadow economy activity. Industries like agriculture, constructions are favorable foe shadow economy, especially from illegal trade, self-service and employment perspective. The number of VAT payers provides information on tax avoidance which is crucial in shadow economy performance [Feige 1989, Thomas 1992, Giles 1995, Gaspareniene and Remeikiene 2016].



\*criminality level was calculated by number of criminal acts per 10,000 inhabitants

**Figure 1**

MIMIC model for estimation the level of shadow economy in Polish regions in 2016

Source: Own proposition based upon Tedds [1998].

The MIMIC approach calculates the hidden variable/shadow economy level/ based on observed and measured indicators. The level of shadow economy is linearly explained by known X causes. The MIMIC model consists of two parts:

$$S = \beta X + \epsilon \quad (1)$$

$$Z = \delta S + \bar{\epsilon} \quad (2)$$

In the further step, by substituting the first equation into the second one the reduced equation form is obtained.

$$Z = \varphi (\beta X + \epsilon) + \mu = L' X + v \quad (3)$$

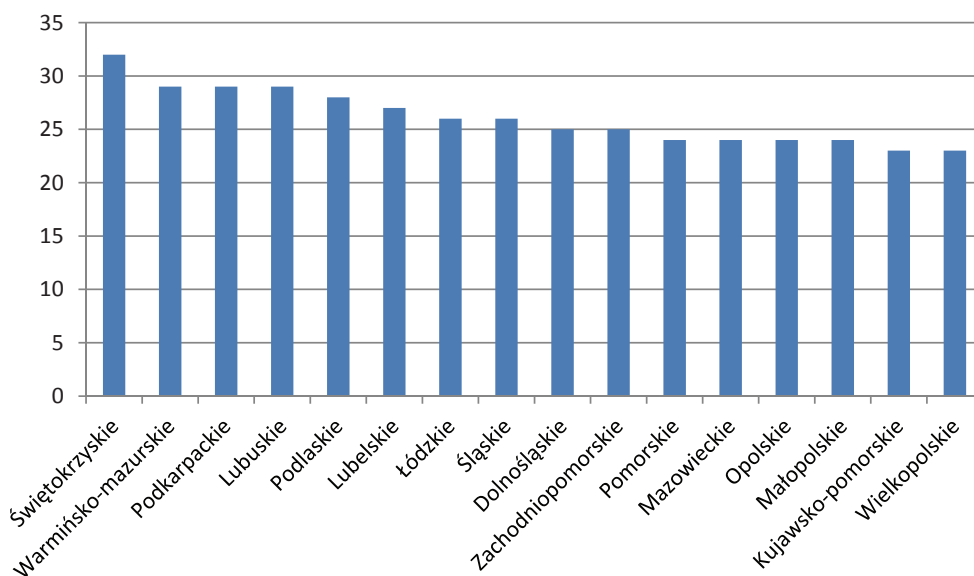
In this way MIMIC model becomes a multi regression function. Structural parameters are appraised with commanding restraints on coefficient matrix  $L'$  and the covariance matrix of the error  $v$  term. All data used in equitation were appraised by Likelihood Procedure, taking this reduced form into consideration and not imposing any restrictions on var-cov matrix. In the third step by the normalization of the reduced equation (3) the matrix  $L'$  performed like:

$$L' = \varphi \cdot \beta = \begin{bmatrix} \varphi_1 \\ \varphi_2 \end{bmatrix} \cdot [\beta_1 + \beta_2 + \beta_3 + \beta_4 \dots]$$

All data come out from Statistical Regional Yearbook. Statistica software for calculation was applied.

## Research findings

Based on methodological approach in the Figure 2 the level of shadow economy in Polish regions was presented.



**Figure 2**

The regional differentiation of shadow economy in Poland in 2016 (as % of regional GDP)

Source: Own estimation.

The level of shadow economy in Polish regions varies. The highest one is noticed in Świętokrzyskie (32% of local GDP), Warmińsko-Mazurskie, Podkarpackie and Lubuskie (29% of GDP). High level was perceived in Podlaskie (28% of regional GDP). The lowest level of shadow economy was observed in Kujawsko-Pomorskie and Wielkopolskie (23% of GDP). In Mazowieckie and Małopolskie the level was 24% of GDP. Based on these findings it should be stated that higher level of shadow economy was detected in low developed regions in Poland while the lower rate of shadow economy was discerned in better developed provinces.



## Conclusions

The research confirmed that the shadow economy in Poland occurs more actively in less developed regions. In better developed ones the level of shadow economy is visible lower. This means another feature that distinguishes the regions' differentiation of the country.

This feature can have more important implications. If we assume that shadow economy animators are not willingly to operate legally and shadow economy is regarded to be a barrier for development it means that the gap among regions will not only remain on the same level but it may even increase as well. Each particular region has its own characteristic specification and it has consequences on shadow economy performance. For example, Warmia and Mazury region is situated to the border with Russian Federation. Such location is favored for smuggling prohibited goods like cigarettes, spirits and fuel as well as more dangerous commodities like weapons and narcotics, and even illegal immigrants.

This activity in the framework of shadow economy is profitable and affects labor market significantly. People involved in such procedure are not so willingly to work officially, they are classified as the unemployed. Such a scheme can be detected in other regions as well. It means that shadow economy is an obstacle to reduce official unemployment rate. Mounting this argument – whenever we face the problem with shadow economy, an unemployment rate will be relatively high one. This was confirmed in Polish case.

Another very important circumstance is connected with the structure of regional GDP. There are some industries favorable for shadow economy. For example construction, agriculture, tourism, services, entertainment are considered with great impact of shadow economy activity. Typical manifestations of such activities are: cash operations – finally no taxes are paid, lowering the sum of invoices, illegal work – no agreements were provided. Additionally, to that the cost of entry to these industries is relatively low one.

Summing up this issue, the less developed regions might be characterized by the specific industries encouraging shadow economy activity. But from the other hand, if shadow economy can be treated as the factor fostering the development (in a way the grease for the wheel) such situation cannot be tolerated for a long run. Shadow economy will harm legal motion and increase the gap among well and less developed regions.

## References

- ADAM M.C., GINSBURGH V., 1985: *The Effects of Irregular Markets on Macroeconomic Policy: Some Estimates for Belgium*, *European Economic Review* 29(1), 15–33.

- ANDERSEN T.M., HOLMSTRÖM B., HONKAPOHJA S., KORKMAN S., SÖDERSTRÖM H.T., VARTIAINEN J., 2007: *The Nordic Model. Embracing Globalization and Sharing Risks*, The Research Institute of the Finnish Economy (ETLA), Taloustieto Oy.
- ARANDARENKO M., 2015: *The Shadow Economy: Challenges to Economic and Social Policy*, [in:] G. Krstič, F. Schneider (eds.) *Formalizing the Shadow Economy in Serbia Policy Measures and Growth Effects*, Springer, Cham Heidelberg, New York, Dordrecht, London.
- BEEVOR A., 2013: *Druga Wojna Światowa*, Znak, Warszawa.
- BILONIZHKO O., 2006: *Measurement and Determinants of the Hidden Economy in Regions in Ukraine and Russia: MIMIC Approach*, National University Kyiv-Mohyla Academy Economics Education and Research Consortium Master's Program in Economics.
- BRAUDE W., 2005: *South Africa Country Analysis. Good Jobs, Bad Jobs, No Job: Labor Markets in Egypt, El Salvador, India, Russia and South Africa*, [in:] T. Avirgan, J. Bivens and S. Gammage (eds.), Global Policy Network, Economic Policy Institute, Washington D.C.
- BUSZKO A., 2019: *Kulturowe uwarunkowania powstawania i funkcjonowania szarej strefy*, Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie.
- CASSEL D., 1984: *The Growing Shadow Economy: Implications for Stabilization Policy*, *Intereconomics*, Verlag Weltarchiv, Hamburg 19(5), 219–225. DOI: 10.1007/BF02928341.
- CZAPIŃSKI J., 2013: *Kapitał społeczny*, [w:] J. Czapiński, T. Panek (red.) *Diagnoza społeczna 2013*, Rada Monitoringu Społecznego, Warszawa.
- DELL'ANNO, R., GÓMEZ-ANTONIO, M., PARDO, A., 2007: *The Shadow Economy in Three Mediterranean Countries: France, Spain and Greece. A MIMIC Approach*, *Empirical Economics* 33(1), 51–84. DOI 10.1007/s00181-006-0084-3
- FEIGE E.L., 1989: *The Underground Economies, Tax Evasion and Information Distortion*, Cambridge University Press, Cambridge.
- GASPARENIENE, L., REMEIKIENE, R., 2016: *The Methodologies of Shadow Economy Estimation in the World and in Lithuania: Whether the Criteria Fixing Digital Shadow are Included?*, *Procedia Economics and Finance* 39, 753–760. DOI-10.1016/S2212-5671(16)30277-5
- GILES D.E.A., 1995: *Measuring the Size of the Hidden Economy and the Tax Gap in New Zealand: An Econometric Analysis*, Working Paper No. 5a. Working Paper on Monitoring the Health of the Tax System, Inland Revenue Department, Wellington.
- JORESOG K., GOLDBERGER A., 1975: *Estimation of a Model with Multiple Indicators and Multiple Causes of a Single Latent Variable*, *Journal of the American Statistical Association* 70(351), 631–639. DOI: 10.2307/2285946
- LOS M., ZYBERTOWICZ A., 2000: *Privatizing the Police-State: The Case of Poland*, St Martin's Press, New York.
- SCHNEIDER F., 2013: *Size and Development of the Shadow Economy of 31 European and 5 other OECD Countries from 2003 to 2012*, Some New Facts.
- SCHNEIDER F., BUEHN A., MONTENEGRO C.E., 2010: *New Estimates for the Shadow Economies all over the World*, *International Economic Journal* 24(4), 443–461.
- SCHNEIDER F., ENSTE D., 2000: *Schattenwirtschaft und Schwarzarbeit. Umfang, Ursachen, Wirkungen und wirtschaftspolitische Empfehlungen*, Oldenbourg, München.

- SCHNEIDER F., ENSTE D., 2000: *Shadow Economies: Size, Causes, and Consequences*. Journal of Economic Literature 38 (1), 77-114. DOI: 10.1257/jel.38.1.77
- SCHNEIDER F., PÖLL G., 1999: *Schattenwirtschaft in Handbuch der Wirtschaftsethik*. In: W. Korff (ed.) *Handbuch der Wirtschaftsethik*. Gütersloh: Gütersloher Verlagshaus, 382–432.
- Statistical Yearbook, 1992, GUS, Warszawa.
- Statistical Yearbook, 2016, GUS, Warszawa.
- TEDDS L., 1998: *Measuring the Size of the Hidden Economy in Canada: a Latent Variable/MIMIC Model Approach*, Department of Economics, University of Victoria, Canada
- TEOBALDELLI D., 2011: *Federalism and the Shadow Economy*, Public Choice 146(3–4), 269–289. DOI 10.1007/s11127-009-9590-0
- THOMAS J.J., 1992: *Informal Economic Activity*, LSE, Handbooks in Economics, London, Harvester Wheatsheaf.
- WULF G., WENIG A. (eds.), 1985: *The Economics of the Shadow Economy*, Springer, Berlin.
- WISEMAN T., 2013: *U.S. Shadow Economies: A State-Level Study*, Constitutional Political Economy 24(4), 310–355. DOI: 10.2139/ssrn.2208637
- WÓJTOWICZ A., 2016: *Zróźnicowanie rozwoju regionalnego w Polsce*, Zeszyty Naukowe Polskiego Towarzystwa Ekonomicznego w Zielonej Górze 4, 302–311.
- VOROBYEV P., 2015: *Estimating Informal Share in Russian Regions*, Working Paper No E15/02. Economic Education and Research Consortium.
- ZELLNER A., 1970: *Estimation of Regression Relationships Containing Unobservable Independent Variables*, International Economic Review 11(3), 441–454. DOI: 10.2307/2525323

## Regionalne zróźnicowanie szarej strefy w Polsce – potencjalny wpływ na rozwój

**Abstrakt:** Celem badań było zmierzenie szarej strefy w Polsce w ujęciu regionalnym. Posłużono się metodą MIMIC (*Multiple Indicators Multiple Causes*). Na podstawie uzyskanych wyników stwierdzono znaczne zróźnicowanie szarej strefy w poszczególnych regionach Polski. Najwyższy poziom szarej strefy w 2016 roku wystąpił w województwie świętokrzyskim (32% lokalnego PKB), a najniższy poziom szarej strefy odnotowano w województwach kujawsko-pomorskim oraz wielkopolskim (23% PKB). Tak duże zróźnicowanie szarej strefy może wpływać na rozwój gospodarczy, dlatego należy podjąć stosowne wysiłki aby zmniejszyć to zróźnicowanie. Szara strefa staje się ważną barierą strukturalną ograniczającą rozwój w regionach Polski.

**Słowa kluczowe:** szara strefa, regiony, czynniki, wpływ, rozwój

**Kody JEL :** O17, C39, H26

Received: 08 February 2019 / Accepted: 20 March 2019  
Otrzymano: 08 lutego 2019 / Zaakceptowano: 20 marca 2019