ECONOMICS & Sociology

Mishchuk, H., Bilan, S., Yurchyk, H., Akimova, L., & Navickas, M. (2020). Impact of the shadow economy on social safety: The experience of Ukraine. *Economics and Sociology*, *13*(2), 289-303.doi:10.14254/2071-789X.2020/13-2/19

IMPACT OF THE SHADOW ECONOMY ON SOCIAL SAFETY: THE EXPERIENCE OF UKRAINE

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Received: October, 2019
1st Revision: April, 2020
Accepted: June, 2020

DOI: 10.14254/2071-789X.2020/13-2/19

JEL Classification: E26, I30, J18, P36

Keywords: shadow economy, social safety, social security, GDP, fiscal losses

ABSTRACT. The links between lawful economy and the shadow economy with social safety are investigated. Based on the existing methods of estimating the shadow economy, it is determined that its official level in Ukraine exceeds the critical one (30% according to the Ministry of Economy) by most estimation methods and was ranging from 18 to 46% in 2018. This significant shadowing of the economy has a negative impact on GDP (correlation coefficient -0.729) and; is directly related to the low competitiveness of the economy as per the world rankings. Having impact on the generation of secondary income through fiscal redistribution mechanisms, the shadow economy has a negative impact on the main components of social safety, including the spread of poverty, maintaining an inefficient cost structure with a high share of food expenditures (which is also a sign of low living standards); and limited housing opportunities. The relationship between the shadow economy on the one hand and economic & social safety on the other (-0.865 and -0.560, respectively) has been determined using the correlation analysis. Economic losses from the reduction of tax revenues to the budget have been estimated to confirm the need to develop mechanisms to unshadow the economy as one of top priorities for public administration in the social sphere in Ukraine.

Introduction

Since the adoption of the Copenhagen Declaration on Social Development (United Nations, 1995) the concept of social security has been attracting increased attention of scientists and monitoring organizations. In this declaration, for the first time ever, the attention of the international community has been focused on the fact that individual security and dignity are indispensable conditions for social development. At the same time, security in the sense of personal protection from social risks of various kinds is a well-studied and well-known object of research, which in practical terms does not call into question the feasibility of appropriate protection mechanisms. Their creation in the form of social security systems and social safety nets depends on the goals and mechanism behind the formation of funds that should provide compensation in case of adverse events. But the meaning of social security as "security" takes into account mainly individual risks and efforts of the state to create appropriate safeguards and/or compensation funds (George, 2018; Luttmer & Samwick, 2018; Nakabayashi, 2019). At the national level, when defining its social security, the terms "security" and "safety" are very often used as synonyms. And although the line between them is really very thin, still, the concept of "security" reflects mostly the financial mechanism of the insurance funds formation. In this case, "safety", to a greater extent, means the general state of security, being safe, and therefore, more comprehensively characterizes the state of protection against risks of both individuals and the state – in terms of social stability, lack of obvious critical states in the areas that are important in society for security reasons.

In this regard, the study of those factors that pose particular risks to social security due to their systemic impact on economic relations is particularly relevant. The shadow economy is a systemic destabilizing factor that has destructive effects on the labour market and, as a consequence, on the formation of insurance financial resources designed to compensate for social risks.

Given that none of the existing methods allows identifying the shadow economy absolutely accurately, we share the most authoritative views in this aspect, in particular those, expressed in the studies of Schneider, F. (2005), the most famous scientist in this field, and his followers (Wu & Schneider, 2019; Mughal & Schneider, 2020), as well as other well-known researchers (Loayza & Rigolini, 2011; Saafi et al., 2015; Saunoris, 2018). Under certain conditions, especially in the context of emerging economies, the shadow economy can have some positive effects, as it is creating conditions for alternative employment and provides income for a part of the population, especially those that have lower competitiveness at the labour market. But in the long run, the existence of the shadow economy is a threat and an obstacle to economic development. Therefore, it is also a threat to ensuring social security of society as whole, not just for certain categories of population.

For Ukraine, which seeks to integrate into European economic and social space, studying the shadow economy and ensuring progress in its reduction is extremely important. (Semenenko et al., 2019; Horská et al., 2019). However, the results of comparisons of the prevalence of the shadow economy in Ukraine and in the EU show that coexistence of the official and shadow sectors is a big problem: 42.9% of the shadow economy in Ukraine is a much higher indicator than that of the EU, where the worst results belongs to Estonia – 24.6%, and the lowest share (6%) in Switzerland (Medina, & Schneider, 2018). It is clear that under the conditions of significantly higher shadowing of employment and income, opportunities and results of state regulation in the social sphere differ significantly, and this, in turn, determines social security of the population.

If only official data on the formal economy sector is analysed, polarization of households' incomes is less obvious and distributive justice is relatively satisfactory (within the

European level). However, social consequences of objectively much lower well-being caused by tax and other losses due to shadowing (Bilan, Y. et al., 2020) are not just negative but actually devastating for the whole country in terms of its prospects for further socio-economic development, including preservation of human capital in the first place.

Thus, the aim of our work is to assess the impact of the shadow economy on social security and its key components. The identified links, together with the consequences for the formation of primary and secondary (formed through the redistribution of value added) income, allow us to draw conclusions about the scale of the threats in the distribution policy of the state and the need to regulate them.

The paper is organized as follows: Section I reviews the literature on the shadow economy within the framework of social safety ensuring; Section II explains the methodology and the dataset; Section III presents the empirical results; and Section IV draws the author's conclusions.

1. Literature review

Social security in the macroeconomic sense is closely linked to macroeconomic stability and welfare. As a result, the shadow economy is becoming a significant risk factor. It determines changes in income and, consequently, living standards both at the household level and, ultimately, at the country level through the functioning of income redistribution mechanism.

Such connections have been theoretically and empirically confirmed in many studies. For example, in the study of opposing models of the country's political structure and respect for human rights (civil law and common law countries), Nakabayashi, M. (2019) proved that a welfare state is closely linked with family security. The different trends of welfare benefits that exist in countries with different types of social relations are largely the result of different family security models. In this case, the sustain growth of the entire economy as well as the growth-enhancing welfare state depends on precedent family security. Also, the social security of families has a positive effect on the development and success of small and medium-sized businesses and self-employment, as a favorable family environment is emerging, and according to the Čepel (2019), it is an essential factor that motivates and helps in doing business.

At the same time, although social security at the macroeconomic level has different interpretations and components that are analyzed, both the concept of "social security" and "social safety" have common features – efforts to protect against risks arising in the environment, and, if necessary, take advantage of appropriate compensations and benefits offered in state or non-state systems of social support and provision of citizens. For example, Bertaccini & Biagi (2018) contribute new insights into the complex links between populations and the environment in Italy. In this regard, since the appearance of one of the most famous scientific papers in this field, the existing approaches to security assessment, to some extent, take into account the components that characterize security in an 'objective sense' (absence of threats) and in a 'subjective sense' (absence of fear) (Wolfers, 1962). The creation of appropriate state-funded and non-state financial supporting funds is the main idea of the functioning of an economic mechanism for maintaining social security of the state, which has clear links between individual perception and security at the national level (Babiarz et al., 2020).

In the aspect of administration of such actions, of creation of financial insurance mechanisms and compensation funds, such approaches are more typical for researchers operating with the concept of "social security" (George, 2018; Kalyayev et al., 2019; Kozlovskyi et al., 2019; Luttmer & Samwick, 2018; Ginevicius, 2019; Ye & Xuefeng, 2017).

This approach is sometimes emphasized even in the title of the work, due to the combination of social security / welfare benefits system (Batty & Orton, 2018).

Regarding "social safety", including functioning of a social safety net at different levels, the researches focus not only on personal social protection. They also cover maintaining security of national importance, i.e. the country's ability to maintain a positive balance in social benefits and motivation, which creates appropriate incentives for employment to maintain a decent standard of living for all citizens. In this context, social safety includes a broader list of indicators (Kawata, 2018; Moffitt, 2015; Kwahar & Lyortsuun, 2018).

Sometimes the same indicators are considered as part of quality of life indicators. In some works, social security as one of the indicators is represented by a too narrow list of the worst manifestations of risks in society (number of rapes, number of thefts; number of cases of serious harm to health; number of murders; number of robberies) (Afanasiev & Kudrov, 2019, p .9), and other components of security are identified in the blocks of material well-being and other components of the quality of social sphere. Conversely, the notion of life quality without a clear justification uses both indicators typical for the analysis of social security and an overly expanded list, closer to the indicators of happiness (Šanda&Křupka, 2018, p.58).

Identification of living standards as one of the components of social security, individually or as part of related concepts is interesting and atypical among these methods of social security assessment, which is developed in the paper of (Kharazishvili et al., 2019). According to the approach of scientists, which is close to the goals of our study, shadow employment to total employment ratio is used as part of the indicators, the guarantee of which is determined by the state to determine safety and quality of life.

In a society, social safety at the individual level is perceived as guaranteed conditions creating a sense of security and confidence in the availability of compensation and benefits. This perception largely determines the motives of economic behaviour at the domestic labour market (Grishnova et al., 2019), tolerance for possible informal employment and income, and motives for migration decisions in case of finding an environment with a higher level of security (Bilan, S. et al., 2020; Mishchuk et al., 2019a; Mishchuk & Grishnova, 2015).

Therefore, changes in social security, which are reflected at the national level due to the cumulative impact of individual risks, require search for factors that affect the main manifestations of social security – those that are perceived as the most important in a given society.

Given the very different positions of scientists not only in the composition of social security indicators, but also in its understanding, for the purposes of our study we use the concepts and indicators of social security used by the Ministry for Development of Economy, Trade and Agriculture of Ukraine in economic security assessments. According to this approach, social security is a state of national development in which the government is able to ensure a decent standard of living regardless of age, gender, income level, promote human capital as the most important component of economic potential (Ministry for Development of Economy, Trade and Agriculture of Ukraine, 2013). According to this approach, social security is one of the 9 components of economic security (along with industrial, demographic, energy, foreign economic, investment and innovation, macroeconomic, food and financial). The distinction between these components is somewhat controversial (e.g. demographic and social security, etc.). But it is by this method that 15 indicators of social security are monitored in Ukraine today, including indicators of living standards, labour market, incidence of socially dangerous diseases and crime. Data on these components of social security are relatively available in official statistics, as some primary data are not published; and only summary indicators of social security are offered to the public, which made authors apply to the Ministry for statistical information needed for this study.

However, with any approach to assessing social security, there are factors that can significantly distort perceptions of the true state of security at both individual and national levels. The main one is the shadow economy. Employment and income in the informal sector significantly distort the real facts about the formation, distribution and redistribution of income in the form of social transfers.

The fact that the informal economy is a flaw in economic relations that cannot be completely eradicated in any society is a well-known fact all researchers of this phenomenon agree with. At the same time, the coexistence of the formal and informal sectors can, to some extent, have a negligible impact on social security; and in some cases it can even have a "mitigating" effect on many social problems.

Thus, following the study of Schneider, F. (2005) on the impact of the shadow economy on macroeconomic growth and stability, which significantly varies in countries with different levels of development, economists often confirm the positive externality of the informal sector to the formal sector (Saunoris, 2018; Bilan et al., 2019b). The influence of such a mechanism is manifested in the creation of a kind of "welfare regime" in emerging economies (Barrientos, 2009). Alternatively, informal employment works as an insurance against labour market volatility in the formal sector, which is especially characteristic of emerging economies (Loayza & Rigolini, 2011).

Informal employment and its short-term mitigating impact on unemployment is positive in terms of personal protection, but undermines the long-term foundations of macroeconomic planning and income redistribution, which do not reflect their hidden part, even without taking into account the moral and ethical aspect of the hidden economy.

The fact that the scale of coexistence of the formal and informal sectors can be very different and their interaction differs significantly in different economies and in different periods of analysis, was also empirically proven by many scientists. Efforts to completely eradicate the informal sector may burden the low-skilled workforce in this sector and increase corruption opportunities in bureaucracy in the absence of institutional reforms (Mughal & Schneider, 2020). Such consequences for the labour market in the form of the dismissal of low-skilled labour force, contrary to the consequences for the social security system, which does not receive enough income from the informal sector, are a dilemma, the solution of which is determined by society's tolerance of the informal sector. Therefore, in the study of the effects of the shadow economy and financing of social benefit programs that help contain or compensate for social risks, different countries are increasingly meeting broader aspirations such as cohesion, inclusion and social justice, and not just poverty eradication through emergency payment schemes (Buck, 2017).

Given the challenges facing Ukraine's emerging economy today, the systemic consequences of the shadow economy in shaping social security are certainly more important, as are the long-term prospects for preserving and developing the country's human capital (Piekutowska & Fiedorczuk, 2018; Bilan et al., 2019a; Mishchuk et al., 2019b). The influence of the shadow economy through the development of the market of mostly unskilled labour, sometimes in criminal activities, is manifested through the impact on the budget system and income policy of the country, the distribution mechanism of which does not involve hidden income.

In this regard, we aim to test the following hypotheses in our study:

H1: the shadow economy with the establishment of standards of dignity in Ukrainian society, the demand for which was clearly outlined after the Revolution of Dignity, has a steady downward trend;

H2: the shadow economy has a significant impact on the social and total economic security of the country;

H3: the shadow economy has a significant impact in terms of strength and direction on all components of social security.

Testing these hypotheses further solves the question: How significant are the financial consequences of the shadow economy for the population? Especially those whose standard of living directly depends on the effectiveness of the mechanism of income redistribution and secondary income in the form of pensions, scholarships, social benefits and other social payments from the state budget.

2. Methodological approach

In our study we used the range of statistical data from 2010 to 2018, the period that allows us to identify changes in the laws of civil relations in Ukraine in connection with the political and economic changes of this period.

To test the hypotheses, we will use the following methods:

- ✓ graphical – to test hypothesis H1, as this is the simplest way to identify the dynamics of the shadow economy in the period we are interested in (before and after the Revolution of Dignity and the public demand for new standards of behaviour in society);
- ✓ correlation analysis – to test hypotheses H2 and H3.

We use a built-in function in MS Excel (PEARSON (Array1; Array2)) with a calculation of Pearson correlation coefficient:

$$r = \frac{n(\sum xy)-(\sum x)(\sum y)}{\sqrt{[n\sum x^2-(\sum x)^2][n\sum y^2-(\sum y)^2]}} \quad (1)$$

Values are interpreted using the scale given in (Babiarz et al., 2020, p.88).

Assessment of the dynamics of the shadow economy on the basis of various methods of its definition, as well as verification of its correlation with social and economic security was carried out on the basis of statistical data of the Ministry for Development of Economy, Trade and Agriculture of Ukraine. At the same time, the primary data on partial social security indicators used in the calculation of its integrated indicator are not available on the website of the Ministry and other official statistical resources of Ukraine. In this regard, we obtained the necessary data on 15 social security indicators for 2018 in response to a request for access to public information.

Thus, the test of hypothesis H3 was carried out on the basis of such descriptive statistics, which are included in the indicators of social security according to the current methodology of its assessment in Ukraine (Table 1).

Statistical significance test of Pearson correlation coefficients between shadow economy level and social safety indicators is conducted based on Student's T-test:

$$t = \frac{r\cdot\sqrt{n-2}}{\sqrt{1-r^2}}, \quad (2)$$

where *n* is the number of observations, *r* is a correlation coefficient.

Based on the existing ratios of the shadow economy and the distribution of national income in Ukraine, we assessed the impact of the shadow economy on the formation of secondary income as an additional manifestation of social security. On this basis, we determined the unreceived tax payments to the state budget, and in accordance with the structure of its distribution in 2018, the unreceived secondary incomes of various types, as well.

Table 1. Social security indicators in Ukraine

Indicator	Partial indicators of social security
X_1	Share of population with per capita average equivalent total income per month, below 75% of the median level of total income, %
X_2	The ratio of the average monthly nominal wage to the subsistence level per able-bodied person, times
X_3	The ratio of the average old-age pension to the subsistence level for disabled people, times
X_4	The ratio of total income of 10% of the most and least well-off population (decile ratio of funds), times
X_5	Share of food costs in household monetary expenditures of households, %
X_6	The volume of consolidated budget expenditures on health care, % of GDP
X_7	The volume of consolidated budget expenditures on education, % of GDP
X_8	Number of HIV-infected people diagnosed for the first time in their lives, persons per 100 thousand population
X_9	The number of patients with active tuberculosis diagnosed for the first time in their lives, persons per 100 thousand population
X_{10}	The total number of full-time secondary school students, the percentage of the total permanent population aged 6 - 17 years
X_{11}	The amount of unpaid wages as of January 1 (July 1) to the wage fund for December (June) of the reporting year, %
X_{12}	Crime rate (number of crimes per 100 thousand population)
X_{13}	Employment rate of the population aged 15 - 70 years, % of the population of the corresponding age group
X_{14}	The ratio of the average monthly wage, calculated on average per hour, in the EU – 27 and in Ukraine, times
X_{15}	The ratio of the average cost of 1 sq. meter of total living space to the average monthly wage, times

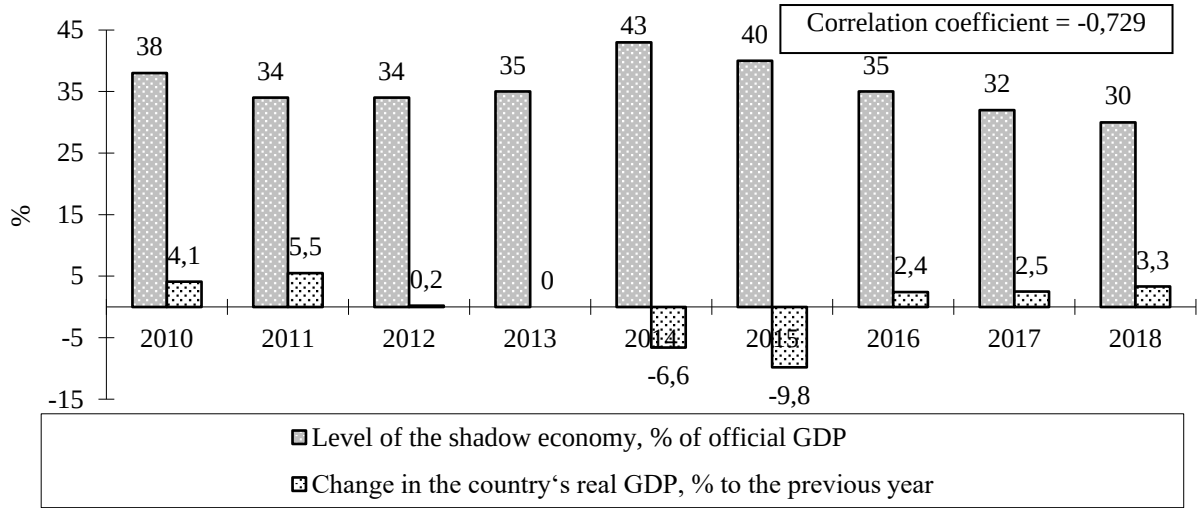
Source: *Ministry for Development of Economy, Trade and Agriculture of Ukraine (2013)*

To perform this study, we used analytical materials of the Ministry of Economic Development, Trade and Agriculture of Ukraine on the shadowing of the national economy, which are posted on the official website in the section "Macroeconomic Analysis and Forecasting". Given that information on the level of economic and social security is not provided in official statistical sources, we received the data on relevant indicators, including partial (Table 1) ones, in response to a request to the Ministry of Economic Development, Trade and Agriculture of Ukraine.

3. Conducting research and results

In Ukraine, the shadow economy is assessed by the Ministry of Economic Development, Trade and Agriculture. The analysis of the relevant data shows that the integrated level of shadowing of the national economy during 2010-2018 changed significantly *(Graph 1)*.

Thus, the corresponding indicator reached its maximum level in 2014-2015 (40% and more). At the same time, since 2016, there has been a tendency to reduce the level of shadowing of the economy, reaching the minimum level in 2018 (30%), which confirms our hypothesis 1.



Graph 1. Integral indicator of the level of the shadow economy and the growth of official GDP in Ukraine, 2010-2018

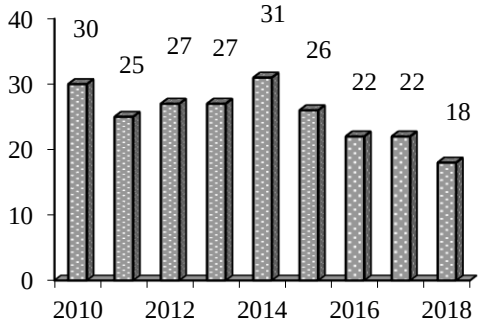
Source: *data from the Ministry of Economic Development, Trade and Agriculture of Ukraine*

Despite, at first sight, the positive dynamics of reducing the shadowing of the national economy, its level exceeded the maximum value for the EU of 24.6% during 2010-2017 (Medina, & Schneider, 2018). At the same time, the increase in the level of shadowing of the economy is accompanied by a decrease in official GDP and vice versa – the correlation coefficient indicates the presence of a sufficiently close and inverse relationship between them. That is, the shadow segment of the economy reduces the competitiveness of the legal economy.

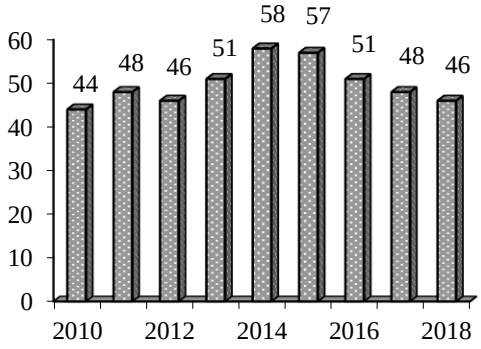
In addition to the integrated indicator, the Ministry of Economic Development, Trade and Agriculture of Ukraine calculate the level of shadowing of the economy according to various methods. A comparison of the level of shadowing of the national economy by different methods (Graph 2) shows that its highest level demonstrates the method of consumption of the population – retail trade. At the same time, the level of shadowing by the method of enterprises' unprofitability and the electric method is significantly lower. Hypothesis 1 is also confirmed both by the integrated indicator and by the four other approaches.

To test Hypothesis 2, we use the data on the level of social security, which is also calculated in Ukraine as a component of economic security by the Ministry of Economic Development, Trade and Agriculture. According to the data of Table 2, the level of social security in Ukraine is quite low and varied between 55-64% during 2010-2018. In the particularly critical period for Ukraine (2014–2016), it decreased significantly, outlining the upward trend since 2017.

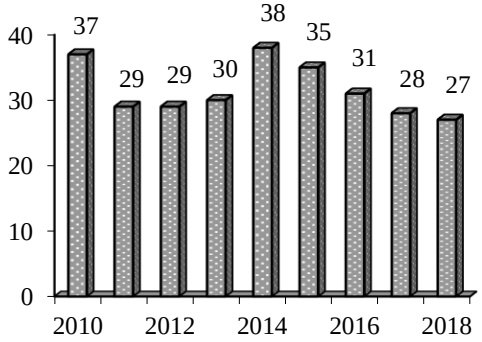
As a result of testing Hypothesis 2 by correlation analysis, it was found that there is an inverse relationship between the level of shadowing of the economy and social security (the higher the share of the shadow segment of the economy, the lower the level of social security and vice versa). It is noteworthy that the correlation coefficient between the level of shadowing of the economy and the integrated index of economic security also demonstrates the presence of an inverse, but significantly closer relationship (R=-0.865). That is, the shadow economy primarily affects economic security and then affects its social component.



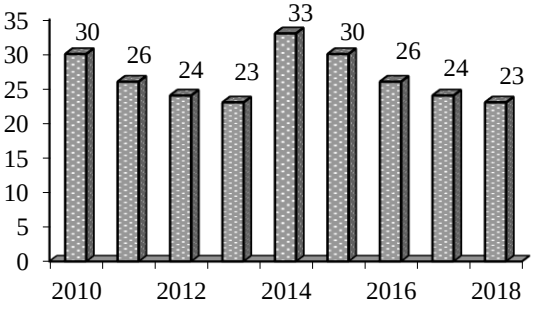
a) method of enterprise's unprofitability



b) method of consumption of the population – retail trade



c) electric method



d) monetary method

Graph 2. Level of shadowing of the national economy by different methods
Source: *data from the Ministry of Economic Development, Trade and Agriculture of Ukraine*

Table 2. Correlation between the level of shadowing of the national economy and indices of social and economic security

Years	Level of national economy shadowing, %	Social security index, %	Integral level of economic security, %
2010	38	57	47
2011	34	59	50
2012	34	64	47
2013	35	62	48
2014	43	57	45
2015	40	55	44
2016	35	56	48
2017	34	59	48
2018	30	60	50
Coefficient correlation		-0,5604	-0,865

Source: *built on the data from the Ministry of Economic Development, Trade and Agriculture of Ukraine*

To clarify the links between the shadow economy and the components of social security described by its partial indicators (Table 1), we tested Hypothesis 3. According to the relevant calculations (Table 3), the shadow economy has a significant impact on only a small number of social security indicators. In particular, the shadow sector of the economy has a direct and

tangible impact on the share of food expenditures; the greater the level of shadowing of the economy, the greater the share of food costs in total expenditures. That is, the shadowing of economic relations is a factor of poverty of the vast majority of the population, because a significant percentage of household spending on food is an indicator of low living standards. An additional argument in favour of the above hypothesis is the presence of a statistically significant inverse relationship between the level of shadowing of the economy and poverty (calculated as the share of the population with per capita total monthly income, below 75% of the median level of total income).

Table 3. *Correlation between the level of shadowing of the economy and social security indicators in Ukraine, 2010-2018*

Indicators	2010	2011	2012	2013	2014	2015	2016	2017	2018	Correlation coefficient (with the level of shadow economy)	t-statistics of correlation coefficient
X_1	24,1	24,3	25,5	24,5	23,4	22,9	23,5	24,4	24,7	-0,689	-2,518
X_2	2,4	2,6	2,7	2,7	2,9	3	3,2	4	4,6	-0,585	-1,909
X_3	1,4	1,4	1,4	1,5	1,6	1,5	1,3	1,3	1,7	0,132	0,352
X_4	5,2	4,9	4,6	5,3	4,9	5	4,9	5,2	5,4	-0,318	-0,886
X_5	51,6	51,3	50,1	50,1	51,9	53,1	49,8	47,9	47,7	0,855	4,357
X_6	4,13	3,76	4,14	4,2	3,6	3,57	3,17	3,43	3,26	0,190	0,511
X_7	7,4	6,63	7,23	7,2	6,31	5,74	5,43	5,96	5,9	0,069	0,182
X_8	44,6	46,3	45,5	47,5	42,4	36,8	39,9	42,7	42,7	-0,330	-0,924
X_9	64,7	63,7	64,4	64,6	56,6	53,3	51,9	48,9	48,9	0,221	0,599
X_{10}	79,8	82	82,5	83	78,4	78,5	78,7	79,1	79,5	-0,361	-1,023
X_{11}	6,2	4,3	3	2,5	2,1	7	4,4	3,4	3,4	0,220	0,598
X_{12}	1100	1136	980	1237	1165	1317	1386	1230		0,081	0,216
X_{13}	58,4	59,1	59,6	60,2	56,6	56,7	56,3	56,1	57,1	-0,154	-0,413
X_{14}	15,9	22,1	12,4	12	16,5	21,8	19,4	15,8	13,2	0,336	0,945
X_{15}	4,8	4,3	3,8	3,7	5	4,9	4,5	3,3	2,6	0,889	5,146

- *statistically significant correlation coefficient*

Source: *authors' own calculations*

Despite the lack of a statistically significant relationship between the shadow economy and other indicators of living standards and income differentiation, the negative correlation coefficients are evidence of a vector of destructive effects of the shadow economy on living standards and income polarization.

In addition, the level of shadowing of the economy shows a fairly close relationship with the cost of 1 m^2 of housing in relation to the average monthly wage. That is, as the level of shadowing of the national economy increases, shadow incomes are directed mainly at the real estate market, increasing the demand for housing, which ultimately leads to an increase in the cost of housing.

Given the significant destructive impact of the shadow economy on living standards and poverty, it is considered appropriate to investigate its impact on income generation. As it is known, the income of the population according to the sources and peculiarities of formation are conditionally divided into primary and secondary.

The primary income is understood as income generated in the field of material production in the process of creating and primary distribution of value added. They are received directly by those who generate national income or are the owners of certain factors of production. They partly come to the individual disposal of employees in the form of wages, and

the other is appropriated by the owners of means of production and capital in the form of business profits, dividends, land rent. The stage of redistribution of value added involves the use of a fiscal mechanism, resulting in the formation of a consolidated state budget and social insurance funds, payments of which provide the formation of so-called secondary income. The latter one is regarded as income received by disabled people or people at risk, as well as workers of the budget (intangible) sphere in the process of redistribution of primary income.

Obviously, the main purpose of the shadowing of economic relations is to maximize primary incomes due to their non-taxation, which has a negative multiplier effect on the formation of secondary incomes. That is, the shadowing of economic relations affects the formation of household incomes along the following logical chain: shadowing of the economy ⇒ shadowing of primary incomes ⇒ maximization of primary incomes as a result of their non-taxation ⇒ fiscal losses of the budget and social insurance funds ⇒ limited financial opportunities for the formation of secondary income. Fiscal losses of the budget and social insurance funds due to the shadowing of the economy are essentially a conditional "increase" in primary income in the shadow sector and potential losses in secondary income.

The calculation of fiscal losses as a result of the shadowing of the economy (Table 4) shows that annually the state budget and extra-budgetary social funds do not receive significant amounts of funds. Thus, in 2018, the corresponding fiscal losses amounted to about UAH 96 billion or 25% of the revenue share of the consolidated state budget and UAH 68.4 billion or 30% of paid insurance premiums.

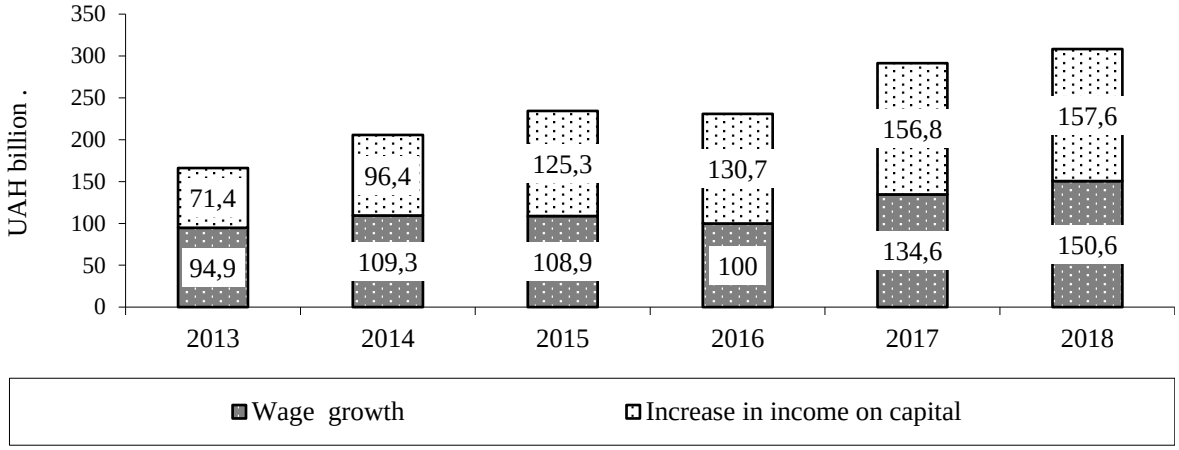
Table 4. Fiscal losses of the consolidated state budget and social insurance funds due to the shadowing of the national economy

Indicator	2013	2014	2015	2016	2017	2018
Revenues (actual) of the consolidated state budget, UAH billion	442,8	456,1	652	782,9	1017	1184
Fiscal losses of the consolidated state budget due to the shadowing of the economy, UAH billion	124,1	158,3	202,8	227,9	281,9	295,9
% to total income	28,0	34,7	31,1	29,1	27,7	25,0
Insurance premiums for compulsory state social insurance, UAH billion	188,8	181,2	188,4	129	188,6	228,7
Fiscal losses of social insurance funds due to the shadowing of the economy, UAH billion	66,2	77,8	75,6	45,1	63,9	68,4
% to all insurance premiums	35,1	42,9	40,1	35,0	33,9	29,9

Source: *authors' own calculations*

In turn, fiscal losses of the budget and social insurance funds are accompanied by a significant increase in primary incomes as a result of tax evasion *(Graph 3)*. In 2018, the increase in wages in the shadow economy due to its non-taxation amounted to UAH 150.6 billion and income from capital comprised UAH 157.6 billion. The positive effect of the economy shadowing in the form of growth of primary incomes is thus obtained by the owners of factors of production, who resort to or agree to certain shadowing schemes.

At the same time, fiscal losses of the budget and social insurance funds due to non-taxation of primary incomes in the shadow economy cause significant changes in the formation of secondary incomes. Calculations show (*Table 5*) that the shadowing of the economy leads to a significant reduction in secondary incomes – pensions, social benefits, wages in the public sector, scholarships.



Graph 3. Increase in primary incomes of the population and business entities in the shadow sector due to tax evasion, UAH billion
Source: *owners' own calculations*

Table 5. Changes in secondary incomes of the population due to the shadowing of the economy, UAH billion

Indicator of change in secondary income	2013	2014	2015	2016	2017	2018
Remuneration in the budget sphere	-47,0	-56,4	-57,7	-64,5	-73,1	-77,2
Payment of pensions and benefits (from the consolidated state budget)	-23,8	-26,9	-29,9	-41,9	-37,3	-35,8
Scholarships	-0,39	-0,43	-0,41	-0,37	-1,43	-1,2
Other social benefits to the population	-14,9	-19,1	-22,7	-31,4	-38,9	-34,1
Pension provision at the expense of the Pension Fund's own funds (while maintaining the share of the Pension Fund in paid insurance premiums), UAH billion	-57,0	-68,5	-67,4	-37,5	-54,9	-60,3

Source: *owners' own calculations*

Thus, the shadowing of the economy, leading to significant fiscal losses of the budget and social insurance funds, polarizes society in terms of income. After all, non-payment of taxes in the shadow sector leads to a significant increase in primary income (wages and capital income), resulting in a decrease in secondary income (social benefits, pensions, scholarships, wages in the public sector). The increase in primary and decrease in secondary incomes due to the shadowing of the economy increases the polarization of the population by income, which is an important factor in reducing the level of the World Bank. At the same time, the official statistical indicators of population differentiation by income do not reflect the real picture, because they do not take into account the availability of income in the shadow sector of the economy.

Conclusions

Social security does not yet belong to the well-studied objects of scientific research, and therefore the terminology and composition of indicators for its evaluation differ significantly in the works of different researchers. Based on the generalization of existing approaches according to different levels and objectives of research, we offer an understanding of social

security as a state of protection of its population from threats to living and working, a state of confidence in ensuring a decent standard of living and incentives for employment and positive social relations. Therefore, it is necessary to study social security in conjunction with the shadow economy being a systemic factor that violates security and reduces the effectiveness of the state mechanism for regulating the level and quality of life.

According to the hypotheses put forward in the study, we confirmed the positive dynamics of the decline of the shadow economy after the Revolution of Dignity on the example of emerging economy of Ukraine. Change of social values, a new stage of social dialogue in the direction of counteracting opaque relations in society, including in the field of employment, had a significant positive impact on some enterprises. Under the influence of new social norms (including those supported by the government in the program of unshadowing of wages, they legalized their activities. At the same time, maintaining a high level of the shadow economy is still a problem for Ukraine. As we assumed in other hypotheses, the preservation of the "shadow" has a negative impact on both the economic and social security of the country, including its partial indicators. Due to some controversial nature of its composition, not all social security indicators have a statistically significant relationship with the shadow economy, which is somewhat illogical, especially in terms of labour market indicators. The consequence of the still high shadowing of economic relations is a significant shortage of budgetary resources aimed at financing secondary incomes in the form of social transfers to the population of various kinds. Thus, the shadow economy has a negative impact on the standard of living of the part of the population whose income is generated from the redistribution of tax revenues.

Given the results, the prospects for further research include improving the methodology for determining social security by supplementing a block of demographic security indicators (which are now a separate block of economic security), as well as a part of the food security block, which characterizes consumption and hence living standards. Some labour market indicators should be improved, which can be exemplified by determination of employment indicators within the group of economically active population, and not the whole population aged 15–70, as it is now, etc. Therefore, the social security indicators used today, incl. its partial indicators are considered to be those that do not fully characterize the security and results of public administration of civil relations and need methodological improvement.

References

Afanasiev, M., & Kudrov, A. (2019). Integrated Indicator of the Living Quality Conditions. *Montenegrin Journal of Economics, 15*(3), 7-21.

Babiarz, P., Kamuda, D., & Migała-Warchoł, A. (2020). Testing the Polish society security. *Journal of International Studies*, 13(1), 81-92.

Barrientos, A. (2009). Labour markets and the (hyphenated) welfare regime in Latin America. *Economy and Society, 38*(1), 87-108.

Batty, S., & Orton, M. (2018). An agenda for fixing the social security/welfare benefits system. *The Journal of Poverty and Social Justice, 26*(2), 291.

Bertaccini, B., & Biagi, G. (2018). Public Information and Perception of the Environmental Risk about the Works for the City High Speed Railroad Underpass in Florence, Italy. *Journal of Tourism and Services*, 9(17), 1-22. doi:10.29036/jots.v9i17.45

Bilan, Y., Sergi, B. S., & Simionescu, M. (2019a). Migration expectations and geography of post-Soviet Ukraine. *Oeconomia Copernicana, 10*(4), 603-625. https://doi.org/10.24136/oc.2019.029.

Bilan, Y., Vasylieva, T., Lyeonov, S., & Tiutiunyk, I. (2019b). Shadow Economy and its Impact on Demand at the Investment Market of the Country. Entrepreneurial Business and Economics Review, 7(2). https://doi.org/10.15678/EBER.2019.070202

Bilan, Y., Mishchuk, H., Samoliuk, N., &Yurchyk, H. (2020). Impact of Income Distribution on Social and Economic Well-Being of the State. *Sustainability*, *12(1)*, 429; doi:10.3390/su12010429

Bilan, S., Mishchuk, H., Bilan, Y. & Mishchuk, V. (2020). Empirical Study of Migration Caused by Well-being in Living and Working Environment. Paper presented at the Proceedings of the 34th International Business Information Management Association Conference, IBIMA 2020: Vision 2025: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage, 11159-11169.

Buck, T. (2017). *Poor Relief or Poor Deal?: The Social Fund, Safety Nets and Social Security*. Routledge. DOI: https://doi.org/10.4324/9781315246468

Čepel, M. (2019). Social and Cultural Factors and their Impact on the Quality of Business Environment in the SME Segment. *International Journal of Entrepreneurial Knowledge*, *7*(1), 65-73. https://doi.org/10.2478/ijek-2019-0005

George, V. (2018). *Social security: Beveridge and after*. Routledge.

Ginevicius, R. (2019). Quantitative Assessment of the Compatibility of the Development of Socioeconomic Systems. *Journal of Competitiveness*, 11(2), 36-50. https://doi.org/10.7441/joc.2019.02.03

Grishnova, O., Cherkasov, A. & Brintseva, O. (2019) Transition to a new economy: transformation trends in the field of income and salary functions. *Problems and Perspectives in Management,* 17 (2), pp. 18–31.

Horská, E., Moroz, S., Poláková, Z., Nagyová, Ľudmila, & Paska, I. (2019). Evaluation of interaction between chosen indicators of development of regions in Ukraine. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, *14*(2), 341-357. https://doi.org/10.24136/eq.2019.016.

Kawata, Y. (2018). For Deepening of Societal Safety Sciences. *Trust Science of Societal Safety*, 217–224. doi: 10.1007/978-981-13-2775-9_19.

Kharazishvili, Y., Grishnova, O., Kamińska, B. (2019). Standards of living in Ukraine, Georgia, and Poland: identification and strategic planning. *Virtual Economics*, *2* (2), 7-36. doi: 10.34021/ve.2019.02.02(1).

Kozlovskyi, S., Grynyuk, R., Baidala, V., Burdiak, V., & Bakun, Y. (2019). Economic Security Management of Ukraine in Conditions of European Integration. *Montenegrin Journal of Economics*, *15*(3), 137-153.

Kalyayev, A., Efimov, G., Motornyy, V., Dzianyy., & Akimova, L. (2019) Global Security Governance: Conceptual Approaches and Practical Imperatives. International Business Information Management Conference (33rd IBIMA). Granada, Spain 10-11 April, 2019, pp. 4484-4495.

Kwahar, N., & Iyortsuun, A. (2018). Determining the Underlying Dimensions of Quality of Work Life (QWL) in the Nigerian Hotel Industry. Entrepreneurial Business and Economics Review, 6(1), 53-70. https://doi.org/10.15678/EBER.2018.060103

Loayza, N. V., & Rigolini, J. (2011). Informal employment: safety net or growth engine? *World Development*, *39*(9), 1503-1515.

Luttmer, E. F., & Samwick, A. A. (2018). The welfare cost of perceived policy uncertainty: evidence from social security. *American Economic Review*, *108*(2), 275-307

Medina, L., & Schneider, F. (2018). Shadow economies around the world: what did we learn over the last 20 years? International Monetary Fund. URL:http://pinguet.free.fr/fmi1817.pdf

Ministry for Development of Economy, Trade and Agriculture of Ukraine. Methodical recommendations for calculating the level of economic security of Ukraine approved on October 29, 2013, order No. 1277. URL:https://zakon.rada.gov.ua/rada/show/en/v1277731-13#n136

Mishchuk, H., & Grishnova, O. (2015). Empirical study of the comfort of living and working environment – Ukraine and Europe: comparative assessment. *Journal of International Studies*, Vol. 8, No 1, 67 – 80.

Mishchuk, H., Samoliuk, N., & Bilan, Y. (2019a). Measuring social justice in the light of effectiveness of public distributive policy. *Administration & Public Management Review*, (32). 63-76. DOI: 10.24818/amp/2019.32-05.

Mishchuk, H., Roshchyk, I. Sułkowska, J. &Vojtovič, S. (2019b). Prospects of Assessing the Impact of External Student Migration on Restoring the Country's Intellectual Potential (Case Study of Ukraine). *Economics & Sociology*, 12(3), 209-219.

Moffitt, R. A. (2015). The deserving poor, the family, and the US welfare system. *Demography*, *52*(3), 729-749.

Mughal, K. S., & Schneider, F. G. (2020). How Informal Sector Affects the Formal Economy in Pakistan? A Lesson for Developing Countries. *South Asian Journal of Macroeconomics and Public Finance*, 2277978719898975.

Nakabayashi, M. (2019). From family security to the welfare state: Path dependency of social security on the difference in legal origins. *Economic Modelling*, *82*, 280-293.

Piekutowska, A., & Fiedorczuk, M. (2018). Immigration from the CIS countries to Russia in the context of the economic crisis in the Russian Federation. *Oeconomia Copernicana*, *9*(4), 677-694. https://doi.org/10.24136/oc.2018.033.

Saafi, S., Farhat, A., & Mohamed, M. B. H. (2015). Testing the relationships between shadow economy and unemployment: empirical evidence from linear and nonlinear tests. *Studies in Nonlinear Dynamics & Econometrics*, *19*(5), 585-608.

Šanda, M., &Křupka, J. (2018). Quality of life evaluation as decision support in public administration for innovation and regions development. *Administratie si Management Public*, (30), pp. 51-66. DOI: 10.24818/amp/2018.30-04

Saunoris, J. W. (2018). Is the shadow economy a bane or boon for economic growth? *Review of Development Economics*, *22*(1), 115-132.

Semenenko, I., Halhash, R., & Sieriebriak, K. (2019). Sustainable development of regions in Ukraine: before and after the beginning of the conflict. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, *14*(2), 317-339. https://doi.org/10.24136/eq.2019.015.

Schneider, F. (2005). Shadow economies around the world: what do we really know? *European Journal of Political Economy*, *21*(3), 598-642.

United Nations. (1995). Copenhagen declaration on social development. *World Summit for Social Development*.

Wolfers, A. (1962) *National Security as an Ambiguous Symbol*, [in] Wolfers A. (Ed.): Discord and Collaboration. Essays on International Politics (Baltimore: John Hopkins University Press), 147-165.

Wu, D. F., &Schneider, M. F. (2019). *Nonlinearity between the shadow economy and level of development*. International Monetary Fund.

Ye, Q., & Xuefeng, H. (2017). Overused Welfare: The Policy Goal Deviation of Rural Minimum Living Security System and Its Interpretation. *CASS Journal of Political Science*, (3), 7.