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THE IMPACT OF THE WORLD ECONOMIC CRISIS ON THE ECONOMIC DEVELOPMENT OF UKRAINE

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Modern development of the global economy is characterized by display of comprehensive globalization processes. Globalization is a multidimensional process of economic and structural reforms, which is characterized by integration
of national economies through trade liberalization, deregulation of the sector and equity operations with the capital, global proliferation of the financial market. A positive feature of globalization is an opportunity for developed countries to use cheap labor markets and redistribute capital. At the same time, developing countries get new opportunities through improved market access technologies, investments, production networks etc. But on the other hand, globalization has led to the increased vulnerability of the countries to the global economic crises, which arise out of their control. Such violations in one of the elements of the system cause instability of the whole system, which is clearly seen in the global economic crisis of 2007 – 2010.

The impact of the global economic crisis on the global economy was significant. Thus, according to the WTO [1] trade growth has slowed starting from 6.4 % in 2007 to 2.1 % in 2008, and in 2009 there was a sharp reduction of 12.2 %. The main characteristic of the globality of the world economic crisis is the decline of most economic indicators in all regions of the world. The EU GDP fell by 16 % in 2007, exports from Asia fell by 5 %. For developing countries, foreign trade indicators, such as exports and imports also declined in 2007, by 7.5 % and 8 % respectively.

In addition to foreign trade falling there were observed significant fluctuations in the real sector of the world economy [1]. Thus, according to the IMF data, global production output increased by 3 % in 2008, fell by 0.6 % in 2009 and increased again by 5 % in 2010, 4.4 % in 2011 and 4.5 % in 2012. For the countries with developed economies, production output grew by 0.5 % in 2008, decreased by 3.4 % in 2009, increased by 3 % in 2010, 2.5 % in 2011 and 2012. This trend indicated gradual recovery of developed countries from the global economic crisis.

However, for most developing countries, the global crisis has led to long-term consequences that provoked structural economic and political transformations of different nature. This phenomenon was widely investigated by the world scientific community.

Thus, the work by V. Cable [2] determined that the global crisis had led to the review of relations with the developing countries that had started to show larger growth rates than developed countries. The study of economic development of Philippines by A. Chiu [3] shows that developing countries got a chance to occupy a significant position in the global economy. D. Dexiang and Z. Rihong [4] write in their works that due to the crisis the Chinese economy has become one of the most powerful economies in the world. N. Haraguchi [5] notes that although the crisis has led to destructive consequences in Thai economy, thanks to the flexibility of its economic system, it managed to recover and demonstrate rapid growth in a short time. M. Kojima [6] stresses in the review of the relation to the structure of the economic system in the crisis period, that more emphasis is laid on environmental economics, where developing countries have big potential.

Thus, the crisis, on the one hand, destroys the existing economic system, and, on the other hand, in the case of its flexibility, the possibilities for transformation and effective management decisions provoke opportunities to increase the economic growth of the national economy and implementation of effective economic reforms.

The purpose of this research is to study the impact of the global economic crisis on the economy of Ukraine and determine its consequences.

Three key issues have been highlighted in the work:

what mechanisms of the crisis expansion were observed in Ukraine?

what was the impact of the world crisis on Ukraine's economy?

what steps have been taken to compensate for the negative impact of the crisis?

Based on the objectives of the research, a methodological approach to the study of the impact of the global economic crisis on the economy of Ukraine has been developed, as shown in Fig. 1.

Fig. 1. **The scheme of the methodological approach to the study of the impact of the crisis on the economy of Ukraine**

Following are the details of each of the blocks.

Block 1. Identifying the mechanisms of the crisis expansion in the Ukrainian economy. The purpose of this block is to study the structural elements of the economy of Ukraine and define the elements through which the crisis began
to spread in the national economy. Determination of the structural element of the economy which is most sensitive to the penetration of the global crisis effects makes it possible to explore the stages of spreading of the crisis, which in turn can help prevent crises of this magnitude.

Block 2. Determination of the impact of the crisis on the economy of Ukraine. The purpose of the block is to assess macroeconomic indicators in the crisis period, determine its destructive impact and study the proportion of the impact of the global crisis on the dynamics of macroeconomic indicators of the country.

Block 3. Investigation of compensatory mechanisms for the localization of the crisis. The target line of the block is the analysis of the state initiatives as to the location of the crisis and study of post-crisis trends in macroeconomic indicators to identify the effectiveness of such initiatives.

The Granger test and vector autoregression models (VAR models) have been proposed as a mathematical tool of the developed methodological approach.

Models of vector autoregression (VAR models) are used to study the connection between time series. In its simplest form a VAR-model connects two rows and in the following manner:

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where y_{1t}, y_{2t} are certain time series of indicative parameters;

$y_{1,t-1}$, $y_{2,t-1}$ are lags of indicative parameters.

Consequently, the value of y_{1t}, y_{2t} is linked not only with the delay of $y_{1,t-1}$, but also with the delay of another variable. Random variables ε_{1t}, and ε_{2t} are called innovations and have the following features:

$Cov(\varepsilon_{jt}, \varepsilon_{ls}) = 0$ for $t \neq s$ for any $j, l = 1,2$;

$Cov(\varepsilon_{jt}, y_{l,t-r}) = 0$ for $r \geq 1$ for any $j, l = 1,2$.

At the same time, for the concurrent moments of time, random variables may be correlated.

The model of vector autoregression allows the inclusion in the right parts of the equations for y_{1t} and y_{2t}, a bigger number of delays of data variables, i. e. lagged variables.

The largest order of delays included in the right side, is called the autoregression order. If the determined order is equal to p, the model is indicated as VAR (p).

If the model considers k time series y_{1t}, y_{2t},..., y_{kt}, then k random variables ε_{1t}, ε_{2t}, ..., ε_{kt} form a random vector whose components are uncorrelated in time and uncorrelated with the lagged values of variables.

An important feature of vector autoregression models is their stability (stationarity), i.e. the ability to oscillate in future about the current level. With a large number of lagged variables in the model, the definition of the stationarity in an analytical form is quite difficult, because sometimes it is suggested that all considered VAR(p)-models are stationary. Stationarity is an important and necessary feature of the VAR(p)-model which is also determined as stability. Stability means that a sequence of external shocks for the VAR-system has a downward effect, that is if shocks end with time, the model is stationary.

If the indicative parameters Y_1 та Y_2 cointegrate, the relationship between them can be modelled with the help of the model of error correction, which combines short-term dynamics with long-term equilibrium relationship and in the case of two variables it is shown in the following manner:

where is the equation of long-run equilibrium (cointegrating equation), normalized by the first variable;

is the equation of long-run equilibrium (cointegrating equation), normalized by the second variable;

ε_{1t}, ε_{2t} $\varepsilon_{1t}$is random perturbations which may correlate with each other.

To keep the model dynamically stable it is needed that , . If cointegration equations are normalized for different variables, the signs of these coefficients must be negative. These coefficients characterize the sensitivity of changes of indicative parameters ΔY_1 and ΔY_2 to the deviation from equilibrium.

The following results were obtained on the basis of the research made.

Block 1. Identifying the mechanisms of the crisis expansion in the Ukrainian economy.

Task 1.1. Determination of the structural element of the economic system through which the crisis began to spread.

In modern studies [7; 8] two main sources of the development of economic systems are defined: the real sector and the financial sector. In the paper by R. Robertson [7], the main one is the production area, which belongs to the real sector and the development of the financial sector is determined by the development of the real sector. According to this point of view, economic development creates demands for certain types of financial mechanisms and the financial system automatically responds to these demands. A number of authors [9; 10] conclude that the financial system has a primary impact on the economy, and efficient development of the financial market, which, combined with a well-developed legal framework allows increasing the economic development of a country and achieving a more efficient allocation of resources and thus providing economic growth.

Although there are two points of view, the indisputable fact is that the financial market is a leader in the world economic system. Thus, by the main indicator of the impact of the financial market on the world economy – an indicator of the depth of the financial market [11], the financial market was 357 % of the global GDP in 2007. Although during the world

economic crisis, this value fell to 308 % in 2008, in the post-crisis period it established at stable 310 – 312 % of the GDP of the world [1]. That is, the amount of the financial market is three times larger than the global real sector.

Thus, the existence of two points of view shows that the source of penetration of the global economic crisis in the economy of Ukraine may be either the financial sector or the real one. Based on the fact that the global economic crisis started as a financial crisis in the US mortgage sector and the financial market is one of the main structural elements of the global economy, it is advisable to determine the financial market as part of the economic system through which the penetration of the global economic crisis to the economy of Ukraine began.

Task 1.2. The study of diffusion of the crisis in the economy of Ukraine.

The financial market is an economic system that includes such segments as the stock, currency exchange, credit and insurance markets. Determination of the financial market as part of the system, which triggered the global economic crisis in Ukraine, can, in turn, define a segment of the financial market, which began the development of the financial crisis.

Among the four identified segments of the financial market, the insurance market is the least developed and integrated into the global insurance space, so it cannot be considered as the cause of the crisis in Ukraine. The Granger test for the assessment of causality of economic processes is used to determine the market which is the cause of the financial crisis. On the one hand, the indicators of the development of segments were examined, and on the other hand, the indicators of the development of the global financial market were studied (Table 1).

Table 1

Indicators of the development of the financial market

Ukraine	World
NBU discount rate	LIBOR rate
PFTS index	Dow Jones index (DJIA)
USD/UAH rate	

As a result of the calculation of the Granger test the following results were obtained (Table 2).

The data shown in Table 2 show that the global financial market affects the segments of the financial market of Ukraine in different ways. The global credit market affects the credit segment of the national market with a lag of 4 months. The world stock market affects the national segment with a lag of two months. At the same time, the following relationship between the national segments of the financial market is observed: the stock segment affects the credit segment with a lag of two months, and the credit segment affects the currency exchange segment with a lag of one month.

Table 2

Calculation of the Granger test for the assessment of causality in the financial markets of Ukraine and the world

The index that affects	The index that depends	Availability of influence	Lag, months
LIBOR rate	NBU discount rate	+	4
Dow Jones index (DJIA)	NBU discount rate	–	–
LIBOR rate	PFTS index	–	–
Dow Jones index (DJIA)	PFTS index	+	2
LIBOR rate	USD/UAH rate	+	1
Dow Jones index (DJIA)	USD/UAH rate	+	1
NBU discount rate	PFTS index	–	–
NBU discount rate	USD/UAH rate	+	1
PFTS index	NBU discount rate	+	2
PFTS index	USD/UAH rate	–	–
USD/UAH rate	NBU discount rate	–	–
USD/UAH rate	PFTS index	–	–

Note. "+" means that there is influence of some factor on another one; "–" means that no conclusion about the availability of influence can be drawn.

The general scheme of the penetration of the global economic crisis to the economy of Ukraine is presented as follows (Fig. 2).

Fig. 2. **The scheme of diffusion of the global crisis in the economy of Ukraine**

Thus, the global economic crisis destabilized the segments of the financial market of Ukraine through international financial institutions in the following sequence: the stock, credit and foreign exchange segments, which in turn led to the destabilization of the internal economic situation in Ukraine.

Block 2. Determination of the impact of the crisis on the economy of Ukraine.

Task 2.1. Analysis of the changes in the trends of macroeconomic indicators of the country's development.

For the investigation of changes in macroeconomic indicators the following indicators were selected: the dynamics of changes in GDP per capita (%), inflation rate and changes in

the foreign trade balance for the period of 2007 – 2013 (Table 3).

Table 3

Macroeconomic indicators of economic development of Ukraine

Year	Dynamics of changes in GDP per capita, %	Inflation rate, %	Changes in the foreign trade balance, %
2007	8.5	16.6	31.8
2008	2.81	22.3	38.7
2009	-14.47	12.3	-44.2
2010	4.57	9.1	31.7
2011	5.53	4.6	34.6
2012	0.4	-0.2	1.7
2013	0.95	0.5	-8.6

The change in the values of macroeconomic indicators shows that the global economic crisis that started in the world in 2007, impacted the whole economic system of Ukraine only in 2009, while the global financial market had been in the state of crisis since autumn 2008. It underlines the fact that Ukraine's economy was not fully integrated into the world economic market, which caused such a delay. But in the case of crisis fluctuations this fact was positive to some degree and provided the Ukrainian government with the time to identify threats of the crisis to the national economy.

Task 2.2. The impact of the global economic crisis on the changes in macroeconomic indicators.

To study the impact of the crisis on the economy of Ukraine, the instrument of dummy variables and VAR models was used. The factor of the availability of the global financial crisis was selected as a dummy variable. In the case of its availability, the value of the dummy variable was equal to 1, otherwise it was 0. To build an effective model, a series of experiments were conducted, depending on the time period in which the value of the dummy variable was equal to 1 (Table 4):

experiment 1 – for the period of 2007 – 2008;

experiment 2 – for the period of 2007 – 2009;

experiment 3 – for the period of 2007 – 2010.

As a result of the calculations it was determined that:

the best model was observed in the case when the dummy variable was equal to 1 in the period of 2007 – 2009 (experiment 2), which demonstrates the impact of the global crisis on the economy of Ukraine;

the impact of the global financial crisis has a lagged structure and its biggest impact is observed with a delay of one year, which indicates a weak integration of Ukraine's economic system in the world economic space and gives an opportunity for a rapid response to prevent a devastating power of the crisis;

the impact of the global crisis with a lagged structure is 53 %, thus the dynamics of national macroeconomic indicators is determined by the influence of the global economic crisis by 53 %. The availability of 47 % of fluctuations is caused by internal Ukrainian tendencies, which, in turn, makes it possible to notice ineffective mechanisms of the crisis prevention in the national economy.

Table 4

The impact of the global financial crisis on the economic development of the country, %

		Dynamics of changes in GDP per capita, %	Inflation rate, %	Changes in the foreign trade balance, %
2007 – 2008	1-year lag	48	32	49
	2-year lag	40	25	41
	3-year lag	16	16	22
2007 – 2009	1-year lag	53	42	61
	2-year lag	48	32	38
	3-year lag	15	10	12
2007 – 2010	1-year lag	40	33	48
	2-year lag	31	28	30
	3-year lag	16	10	25

Thus, as a result of the research made, the impact of the global economic crisis on the economy of Ukraine has been proved and its lagged structure has been determined. In the author's view, the lagged structure (1 year) and the delay of response of the segments of the financial market should be actively used at the state level of regulation to develop preventive measures, aiming to localize and lower the degree of aggressiveness of the global crisis events on the economy of our country.

Block 3. Investigation of compensatory mechanisms for the localization of the crisis.

Task 3.1. Determination of compensatory mechanisms for the localization of the crisis.

The main compensatory mechanism for the mitigation of the crisis in the economy of Ukraine was the mechanism of attraction of IMF funds. During the crisis period of 2008 – 2010, Ukraine received 10.5 billion dollars, and this sum of money amounted to 64 % of the total loans of 16.4 billion dollars. The program was approved in November 2008, which made it possible to stabilize the hryvnia rate to the dollar rate at 7.99 in the autumn of 2009. The dynamics of loans declared and granted by the IMF is shown in Fig. 3.

This graph shows that the largest tranche Ukraine got was in the crisis period of 2008 – 2010.

Task 3.2. Analysis of post-crisis trends.

Analysis of post-crisis trends is appropriate to be made from two positions. The first is the analysis of macroeconomic indicators after the crisis, and the second is analysis of the socio-economic and political events in the country.

Fig. 3. **The dynamics of credits, announced and granted by the IMF in 1994 – 2002**

Basing on the first line of the data analysis according to Table 3, it can be concluded that since 2010, signs of gradual getting out the crisis began to emerge in the country

due to the compensatory mechanism of attraction of IMF credit resources.

However, the dynamics of the data presented in Fig. 3 and Table 3 for the period of 2010 – 2012 shows that this trend, unfortunately, did not become dominant. So, unless the compensatory mechanism of credit relations with the IMF had worked, Ukrainian economy would have a tendency to increase. However, it was found out that Ukraine was not fulfilling its obligations to the IMF, which consisted in a gradual reduction of the budget deficit (to 3.5 % of GDP in 2011, to 2.5 % in 2012, to 5.0 % in 2009) and reduction of the public debt below 35 % of GDP by 2015. This led to a failure to receive a significant part of loans announced in 2010, and the Ukrainian economy experienced a significant drop. This triggered the fact that in 2012 – 2013 there was a minimal increase of GDP per capita and falling of the trade balance.

In addition, this dependence on loans led to the fact that in 2013 government tried to get better credit conditions, and therefore was looking for the borrowers except the IMF and the EU, which further led to political and economic crisis in the country.

The following conclusions have been drawn based on the research:

the global financial crisis of 2007 – 2010 had devastating consequences for the entire global economic system,
and, in particular, for the economy of Ukraine, which led to a drop in macroeconomic indicators, increased inflation and destabilization in the financial and real sectors of the economy;

the financial market of Ukraine was the most sensitive to the global crisis fluctuations and showed a slight lag dependence on the global financial trends. However, the presence of such a time lag provided the Ukrainian government with the time for the development of preventive measures for the global crisis;

the internal structure of the financial market also has a lagged dependence, which is evident in the sequential influence of the segments of the financial market on each other. Such dependence also empowers the abilities for the localization of the crises in one of the segments of the financial market;

the global financial crisis of 2007 – 2009 had a 53 % impact on the national economy, and it indicated negative trends in it;

IMF credits were chosen by the government as a compensatory mechanism; however, this mechanism turned out to be fatal for the Ukrainian economy. There was a short-term improvement of the economy with the help of the credit money, but the lack of internal compensatory mechanisms did not allow the government to carry out further structural transformation of the economy of the country in the post-crisis period and ensure effective functioning of the economy without a significant loan. This situation further led to not only worsening
of the economic condition of the country, but also to the global systemic crisis of the entire state.

Approaches and means of forming adequate internal compensatory mechanisms and developing a necessary legal basis and its implementation require advanced studying and can be regarded as a further research area.

References: 1. Global Financial Stability Report. Statistical Appendix // Report of IMF. – April, 2012. – Washington D.C. : International Monetary Fund [Electronic resource]. – Access mode : http://www.imf.org /external/pubs/ft/gfsr/2012/01. 2. Cable V. The Storm: The World Economic Crisis and What it Means / V. Cable. – London : Atlantic Books, 2010. – 192 p. 3. Chiu A. Sh. F. The Impact of the Global Economic and Financial Crisis over Developing Countries' Manufacturing Industry: "Green" Sunrise or "Brown" Sunset Response? The Philippine Paper Recycling Industry Case Presentation / A. Sh. F. Chiu. – Vienna : United Nations Industrial Development Organization, 2011. – P. 61. 4. Dexiang D. W. The Impacts of the Financial Crisis on Industry in Developing Countries: China Case Study / D. W. Dexiang, Z. Rihong. – Vienna : United Nations Industrial Development Organization, 2011. – P. 61. 5. Haraguchi N. Impact of the Global Economic Crisis on the Thai Automotive Industry: From the Perspective of the Interplay between Shocks and the Industrial Structure / N. Haraguchi. – Vienna : United Nations Industrial Development Organization, 2010. – P. 50. 6. Kojima M. Can the Organic Recycling Industry Contribute to the Recovery of the Manufacturing Sector in Asia? / M. Kojima. – Vienna : United Nations Industrial Development Organization, 2011. – P. 61. 7. The Global Economic Crisis: Sectoral Coverage: Trends in Employment and Working Conditions by Economic Activity: Statistical Update, Third Quarter 2009 // Working Paper. – No. 271. – Geneva : ILO, 2010. 8. Lucas R. Monetary neutrality [Electronic resource] / R. Lucas // Lecture to the memory of Alfred Nobel, December 7, 1995. – Access mode : http://www.nobel prize.org/nobel_prizes/economics/laureates/1995/lucas-lecture.pdf. 9. Levine R. Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, (with Asli Demirguc-Kunt) [Electronic resource] / R. Levine. – MIT Press, 2001. – Access mode : https://openknowledge.worldbank.org/bitstream /handle / 10986/4154/WPS4943.pdf. 10. Klein L. Some Economic Scenarios for the 1980's / L. Klein // Nobel Prize in Economics documents 1980-1. – S. l. : Nobel Prize Committee, 1980. 11. Benchmarking Financial Development Around the World / Č. Martin, A. Demirgüç-Kunt, E. Feyen et al. // Policy Research Working Paper 6175. – Washington, DC : World Bank, 2012.

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