

**Transformational processes
the development of economic
systems in conditions of
globalization: scientific bases,
mechanisms, prospects**

**Collective monograph edited by
M. Bezpartochnyi**

ISMA University
Riga (Latvia) 2018

**Ekonomisko sistēmu attīstības
transformācijas procesi
globalizācijas apstākļos:
zinātniskie pamati,
mehānismi, perspektīvas**

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The authors of the book have come to the conclusion that it is necessary to effectively use the management approaches to regulate modern international economic relations, methodological tools for analyzing international competitiveness and innovation. Basic research focuses on assessing the structure of R&D costs, analysis of innovative development the industrial enterprises, diagnostics of direct and portfolio investments, stress-testing of the banking system, marketing support of companies' competitiveness, diagnostics of structural transformations in agriculture. The research results have been implemented in the different models of reengineering business process, reforming the pension reform, developing the human resources capacity of the region and managing human resources, managing quality in the hotel-restaurant business and tourism, forming a logistics strategy, innovative technologies in education. The results of the study can be used in decision-making at the level of international business, ministries and departments that regulate international relations, ensuring security and overcoming risks. The results can also be used by students and young scientists in modern concepts of the formation of international economic relations in the context of ensuring the competitive advantages of actors and improving innovation policy.

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**BANKING SYSTEM
STRESS-TESTING
AS A TOOL FOR
THE
DEVELOPMENT
OF ECONOMIC
SYSTEMS**

In the new global economy after crises 2008 and 2013, appraisal the concepts banking stress-testing according different regulatory acts has become a central issue for development of economic systems. The most effective approaches to stress testing and means of clearing the banking system in USA, Great Britain, the EU was realized in the recommendations of the Basel Committee on Banking Supervision.

Starting from 2014 the banking sector in Ukraine has undergone major structural changes, which has led to the closure of many Ukrainian banks by the regulator. The National Bank of Ukraine (NBU) has agreed plans for recapitalization, which provides measures for withdrawing loans from related parties of the bank on bank loan portfolios during three years. Ukrainian banks, which will have bigger risks than the established limits related to loans with related parties, will be closed before the beginning of 2019. Large banks must have a capital adequacy ratio (CAR) at a rate of 5% of assets with weighted risk and achieve a ratio of the maximum lending loan presence of related parties

in relation to regulatory capital of 25% in the beginning of 2019. (UCRA, 2017) [1].

Stress-tests have a predictive character. They allow determining the sensitivity of the bank's loan and deposit portfolios or the entire banking system to negative shocks, assess the impact of the effects of these shocks on the financial performance and capital of banks, and to determine the measures that need to be taken for strengthen of banks' resilience. So, researching the stress-testing methods and their results in Ukrainian banks has essential role for strengthen of financial stability and for development of economic systems.

Various foreign authors studied the stress-tests as instrument of banking system diagnostic. Thus, Dua Pami & Kapoor Hema (2017) were the first to examined macro stress-testing results of Indian Bank Groups using panel data from 1997 to 2014 [2]. Regarding stress testing of bank performance, Salvador Clement-Serrano (2016) was the first to investigate and evaluation the stress test based on Oliver Wyman in central Spain Bank [3]. El Mehdi Ferrouhi (2017) analyzed the long-term determinants of Moroccan commercial banks performance, for the period 2005-2015, using the Johansen co-integration test [4]. By using stress test for 15 largest Danish banks and analyzing excess capital adequacy Danmarks Nationalbank in the period 2008-2010, Soren Korsgaard (2017) found that access for banks to external funding in the financial markets may be challenged if the minimum capital requirements are breached [5].

The issues of stress testing and banking regulation were investigated by significant number domestic scientists. So, Andriy Ramskyi et al. (2017) noticed that changes in the banks' business environment in Ukraine, taking into account the impact of domestic and global financial instability and analyzed of main indicators of Ukrainian banks' financial stability within the period of 2014-2017 [6]. Svitlana Yehorycheva et al. (2017) analyzed of the Ukrainian banks micro- and macroeconomic indicators of the capital stability of domestic banks within the period 2007-2016 and has been detected that a significant reduction in return on equity of the Ukrainian banks in 2014-2015 even with restoring their liquidity has had a crucial destabilizing impact on their capital stability [7].

Issues of financial stability management of the banking sector of the economy and regulation of the banking system are being managed by a large number of foreign and domestic scientists. The research of stress-testing different banking systems as a whole is a very important, because

allow to find out what losses and risks the banks or the system as a whole can received in unexpected events.

Main aim in this study is to investigate the differences between stress-testing program of the world's leading banking systems and Ukrainian bank system and systematizes the stress-testing experience from Ukraine. Thus, the experience of several programs has been studied to select stress-testing approaches in Ukraine, such as stress-testing program in USA in 2015 under the Dodd-Frank Law, stress-testing program in all EU member states in 2014 and programs of stress-testing in the UK at the Bank of England in 2015.

There are many features in methodology of stress-testing programs USA banks, all EU member states bank systems and United Kingdom in the Bank of England. A characteristic of the stress-testing program in the USA under the Dodd-Frank law in 2015 is the scope of application “top-down”, when the testing forecasts a balance sheet of the bank’s holding company, assets with weighted risks, net profit and appropriate capital adequacy ratios under conditions imposing stress scenarios.

In analogy to the stress-testing program in the USA, the stress-testing program in all EU member states in 2014 is also characterized by the scope of application “top-down”. The peculiarity of the approach to stress-testing in the EU consists in the fact that the impact of risk factors on the solvency of banks through the calculation of indicators of equity capital adequacy of the first level is assessed, with a focus on solvency and market risks.

In contradistinction to the stress-testing program in the USA under the Dodd-Frank law in 2015 and the stress-testing program in all EU member states in 2014, the stress-testing program in the United Kingdom in the Bank of England in 2015 has the scope of application “bottom-up”. In this case, banks provide their forecasts; the Bank of England conducts testing on the basis of bank forecasts and makes adjustments. Thus, the “bottom-up” approach of the Bank of England has some adjustments, in particular: simulation of resizing and balance composition of the business, absence of restrictions upper limit of income and the lower limit of costs restrictions and using a set of analytical tools in addition to its own forecasts of participating banks.

Paying attention to international experience of stress-testing, Ukraine has developed its approach to stress-testing of the banking sector of Ukraine taking into account the specifics of the national banking system. The comparative analysis of stress-testing in USA, EU, United Kingdom and Ukraine approaches is given in Table 3.7.

Table 3.7

**Comparative analyze of stress-test approaches in
USA, EU, United Kingdom and Ukraine (2014-2019)**

Indicators	Stress-testing program			
	USA	EU	UK	Ukraine
Period	2015	2014	2015	2018-2019
Institutions	31 holding companies of the bank (HCB)	123 banking groups from 22 countries	7 largest banks in the UK and construction companies	30 banks
Participation criteria	HCB with assets > = 50 billion dollars USA and non-bank financial companies	Sampling of banks with assets >= 50% of the national banking sector	All banks and Construction companies with retail deposits = > £50 billion.	Top 30 of banks
Consolidation level	HCB	Banking group	Highest level consolidation	NBU
Data sources	Data by the FRS and third parties	Data collected by national authorities regulators	Data of banks, England Bank and third parties	Data of bank, audit companies and NBU
Forecast period	9 quarters	3 years	5 years	2 years
Scenarios	Basic, Unfavorable, Extremely negative	Basic, Unfavorable	Basic, annual cyclical	Basic + pessimistic

Source: Basel Committee on Banking Supervision (2017) [8].

So, research on different policies in the Central banks USA, EU, UK demonstrating different conceptions of stress testing, which can be traced during three years in each country. Taking into account the foreign experience of stress-testing of the banking system Ukraine chose the scope of application “top-down” – an approach which is applied in all EU member states with certain adjustments.

Thus, NBU diagnostic research of the Ukrainian banking system was

based into account the problematic aspects of the stress-testing methodology and methodology in the EU and other countries, IMF recommendations and macroeconomic indicators Ukraine.

The NBU received results of the stress-testing on the basis of research of the expected change in the quality of loans of large borrowers, as well as other loans, with the exception of loans from government institutions. An individual approach envisaged an analysis of the financial position of large borrowers (over 200 million UAH or 5% of regulatory capital) and an assessment of the probability of non-payment due to low internal cash-flow generating capacity.

In according model for all big borrowers was provided stress-testing on an individual basis. At the same time, the financial results were modeled basing on the data of the financial statements, the basic macroeconomic scenario and data of the bank adjusted by the results of the inspection for each big borrower.

According to the regulations, the historic quality of debt servicing by the borrower was affected by the probability of default musty. Therefore the main assumptions of stress-testing were:

- macroeconomic factors affect the financial performance of banks and bank borrowers;
- the schedule of repayment of the borrower's debt to the bank in comparison with the borrower's operating cash flow determines the forecast quality of debt servicing;
- borrower's income and expenses are based solely on verified historical data what means that business plans, forecasts and intentions were not accepted.

The public sector in the form of a credit portfolio of state banks did not pass stress-testing and for the rest of the credit indebtedness of banks in stress-testing a portfolio approach was used. Consequently, on a portfolio basis, stresses were tested on other loans of legal entities (apart from public sector loans and large borrowers), mortgage loans and other loans of individuals. At the same time, migration of loans between performing and non-performing (NPL) loans was estimated with using an econometric model which evaluates the dependence of credit quality on macroeconomic indicators.

The diagnostic research of the banking system was initiated by the National Bank in 2015 and included a mandatory stress-testing of the 20th largest banks. Then 60 banks took part in the stress-testing in 2015-2016 that accounted for 97% of all system assets or 1518 billion UAH. Asset Quality Review and its impact on banks had shown that many

banks need to comply with the requirements for capitalization on the results of stress-testing in 2015-2016. The NBU requirements for capitalization of banks as of 01.04.2017 are shown below in Figure 3.1.

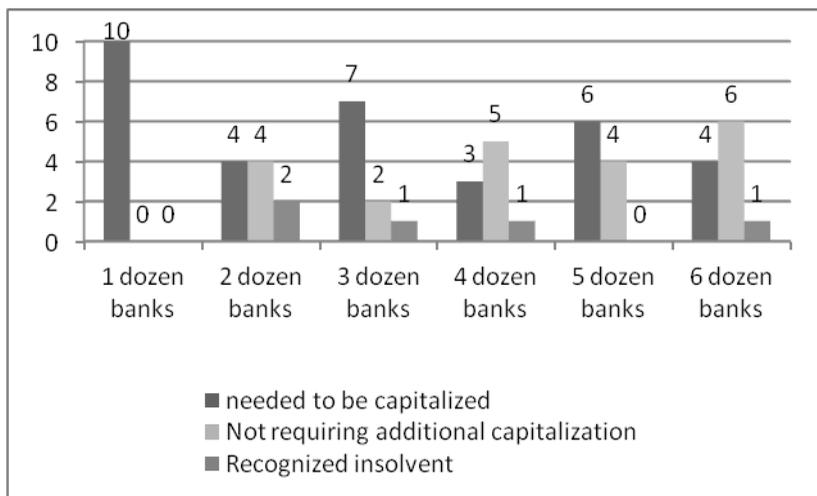


Figure 3.1 Number of banks needing additional capitalization, pcs.
 Source: National Bank of Ukraine (2018) [9].

In the process of stress-testing one bank of the 4 dozen was transferred to the 6 dozen banks. It was the 4 and the 6 dozen banks that had the highest percentage of banks that did not need capitalization. Thus, according to the results of stress-testing from 60 banks, 34 banks required to be capitalized, 21 bank did not required to be capitalized, 5 banks were recognized insolvent.

Experience from Ukraine showed, that stress-tests as instrument of banking system diagnostic contributed to a decrease in the number of financially unstable banks. Since the beginning of 2016, the number of functioning banking institutions has decreased in Ukraine. In January, 2016 only 117 banking institutions had the license of the National Bank of Ukraine including 41 banks with foreign capital. In January 1, 2017 only 96 banking institutions with license including 38 banks with foreign capital and in January 2018 only 82 banking institutions and 36 banks with foreign capital. Detailed information on the dynamics of changes in the number of banks in Ukraine in 2016-2018 is shown below in Figure 3.2.

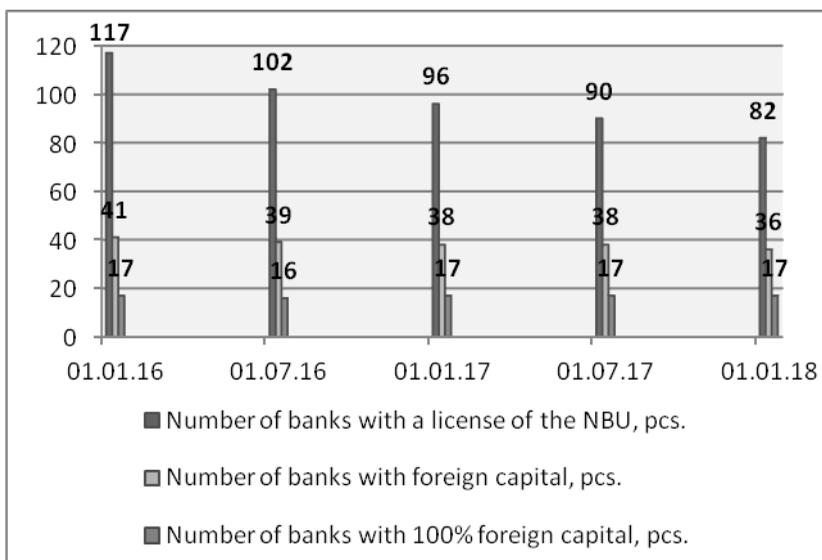


Figure 3.2 Dynamics of changes in the number of Ukrainian banks, pcs.
 Source: National Bank of Ukraine (2018) [9].

In total, during 2016-2017 the NBU revoked of bank licenses for 35 banks, including 2 banks with foreign capital. The relative stability of the number of banks with foreign capital and the constant number of banks with 100% of foreign capital in 2016 and 2018 years indicates that the methodology for calculating the borrower's credit risk have been already used in their activities by the management of foreign banks, based on assessing the real solvency of the borrower and his ability to perform conditions of the contract.

The banking system is an important element of the economy of any country. Today, many scientists and banking regulation experts consider stress-testing as an effective tools for diagnosing financial stability of the banking system for development of economic systems as a whole.

The stress-testing of Ukrainian banks has revealed some features in development of economic systems. Optimization of the banking system as a result of the diagnosis of the banking system. According to the stress-testing results, there were found a number of Ukrainian banks that had an ineffective policy in forming reserves for reimbursement of potential losses through active banking operations. Consequently, several insolvent banking institutions were withdrawn from the banking

market due to their inadequate capitalization and the inability of owners (shareholders) to provide the bank with an appropriate financial support level, banks that were incapable of complying with reserve provisions for potential losses due to active banking operations and banks that decided to reorient in other types of their financial activities at the request of their owners.

According to the results of stress tests, NBU identified “weaknesses” of banking regulation and supervision and implemented the following steps:

- Accepted New Provisions on Credit Risks
- NBU focused on the financial condition of the borrower
- Excused of risk types of collateral
- NBU Analyzed of borrower taking into account the risk of the group of companies
- NBU made decision about regular stress tests banking system
- NBU reformed of the banking supervision function.
- NBU developed schedule of debt reduction of banks
- NBU created the single credit register.

Considering the above, for identify the development of economic systems methodological tools offered on the basis of scoring and rating. The three criteria: Public sector, Legal entities and Individuals recommend used for stress-testing model for Ukrainian banks to determine the potential for the development of economic systems. Criteria and indicators the stress-testing model for Ukrainian banks for identify the development of economic systems are presented in Table 3.8.

Thus, the experience of Ukraine in the approach to stress-testing of the banking system has wide prospects and needs constant attention from the banking sector of the EU countries in order to optimize the interconnection of the banking systems and development of economic systems of the European Union as a whole.

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Table 3.8

Criteria and indicators the Ukrainian banks stress-testing model to determine the development of economic systems

Institutions	Participation criteria	Scenarios	Data sources
Legal entities	Big borrowers	Basic, Unfavorable, Extremely negative are stress-tested on an individual basis annual	Data of bank, audit companies and NBU
	Holding companies of the bank	Basic, Unfavorable, Extremely negative are stress-tested on an individual basis annual	
	Banking groups	Basic, Unfavorable, Extremely negative are stress-tested on an individual basis annual	
	Agro companies	Basic, Unfavorable are analyzed on a portfolio basis annual	
	IT companies	Basic, Unfavorable are analyzed on a portfolio basis annual	
Public sector	Big borrowers	Basic, annual cyclical are stress-tested	Government Supervisor Committee on Financial Stability
Individuals	Mortgage loans	Basic, pessimistic quarter cyclical are analyzed on a portfolio basis	Data of NBU, audit companies and information from third parties
	Cars loans		
	Cards loans		
	Other loans of individuals		

Source: Proposed by the authors [8-9].

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**DETERMINANTS OF
INCREASING THE
FOREIGN DIRECT
INVESTMENT
INFLOW INTO THE
REPUBLIC OF SERBIA**

Introduction

The Republic of Serbia, currently one of the largest and fastest growing markets in the Western Balkans, has undergone radical reforms in the process of transition to a market economy and has improved business conditions, making it the country with the most attractive economic potential for developing business and investment activities. However, despite this fact the Republic of Serbia is not yet saturated in terms of foreign direct investment inflow.

The goal of this science article is to investigate and quantify the impact of key indicators on the possibilities of intensifying foreign direct investment inflow into the Serbian market by applying econometric methods.

After a period of economic and political crisis in the 1980s and the rise of nationalism, the Socialist Federal Republic of Yugoslavia disintegrated along the borders of its individual republics in the early 1990s. Currently, these economies are designated as Western Balkan

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