

інвестиційної привабливості. Позитивна оцінка буде сприяти притоку інвестицій до підприємства від інвесторів, підвищить гарантію вкладення коштів та сприятиме загальному розвитку як окремого підприємства так і країни загалом.

Використані джерела:

1. Бланк И.А. Инвестиционный менеджмент.- К.:МП «ИТЕМ» ЛТД, «Юнайтед Лондон Трейд Лимитед», 1995 - 448с
2. Нападівська І.В. Теоретичні та методичні аспекти дослідження інвестиційної привабливості України // Вісник ДонДует №4(28).- 2005.- С.55-61.
3. Буднікова Ю. Методика оцінки інвестиційної привабливості підприємств, 2012 – с.5
4. Вірянська О.В. Оцінка інвестиційної привабливості, 2016 - с.115
5. Фактори, що впливають на інвестиційну діяльність і ефективність інвестицій. URL: https://studme.com.ua/199207286846/investirovanie/factory_vliyayuschie_investitsionnuyu_deyatelnost_effektivnost_investitsiyu.htm.
6. Кочешков А. Нефинансовые показатели деятельности компании. URL: <https://upr.ru/article/nefinansovye-pokazateli/>.

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MODELLING THE SYSTEM OF CREDIT RISK MANAGEMENT IN BANKS

Generally, in recent 20 years, there is a tendency in Ukraine that NPLs rate has increased and become high enough even though there is quite stable economic situation [1]. It's very problematic for financial institutions due to annual losses, so they remain almost permanently in loss. If default credits are growing up, banks as a result could not exist and be compatible on the financial market. Consequently, economic stability as well as economic system in the whole will be broken. To get a deeper understanding of the NPLs structure and the whole system about why NPL are occurring in Ukraine as well as why default loans have more percentage in the total loan portfolio of the banks, whereas the situation in the country stabilize. We are going to make a research of the reasons of the NPL's occurring and growing [3] from the bank's prospective, forecast of developing of the NPL in the nearest future and what policies should be implemented to improve this situation. This research is important for banks as stakeholders because high level of default loans can lead banks to become bankrupt. The reference modes of the model (NPL's rate, Total loans and NPL in Ukraine) is provided below (see figure 1).

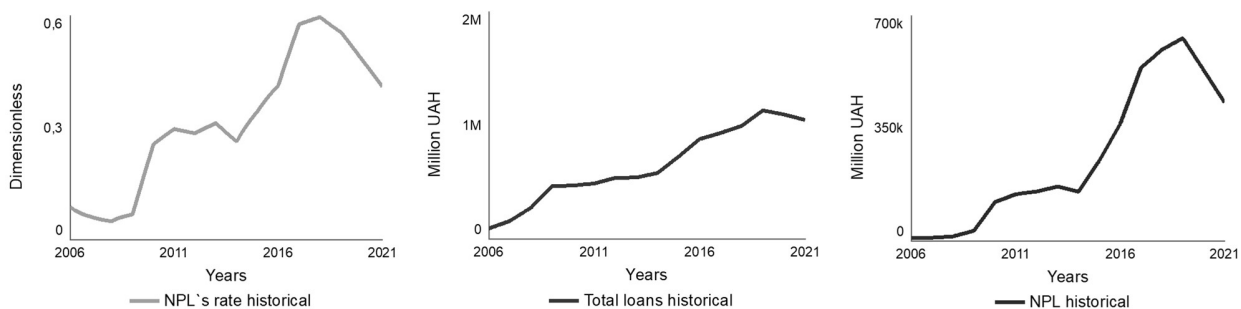


Figure 1. Reference modes of behavior of system dynamics model

Source: Elaborated by the author based on data [3]

The intention of this study is to identify the reasons of the huge part of NPLs in the total credit portfolio of the banks and which links it establishes. Having studied the structure of non-performing loans, mechanism is functioning in Ukraine, the following causal loop diagram (CLD) is provided below (see figure 2.).

Balancing loop 1 (B1). This is the main balancing loop in the model, which shows the important links of the whole bank's lending mechanism. Non-performing loans plays a very important role and have a great impact on the repaying of the loans. Each bank tries to monitor the credit history of the borrowers and to establish the credit limits to 48 prevent itself from the default loans. The less defaults bank has, the more money from credits it will receive, otherwise, the financial institution have less revenue and no opportunity to lend money, in turn, less amount of credits in whole.

Reinforcing loop 2 (R2). The main bank's goal is to receive revenue. Almost all of the revenue could be received by lending the money to the consumers and firms with a mark-up and receiving the money back in larger numbers. With higher revenue, these financial institutions will be ready to give even more credits. As the supply creates the demand, the consumers will be borrowing more, which will expand the total loans portfolio of the banks.

Reinforcing loop 3 (R3). First-world countries have stable economic situation in the country, that's why the ratio of their national currency to the leading world currencies will be almost the same during the years. However, Ukraine is constituted as a developing country. Due to this, the ratio of the UAH to the USD or EUR is fluctuating a lot. For instance, on the 03.02.2015 the exchange rate of UAH against EUR was 18,36, however on 26.02.2015. it was already 34,04 (Data of NBU). This situation lead to bank bankruptcy, and even in 2011 it was established a ban on the provision of the consumer credit agreements in foreign currency (Adopted law in Ukraine in 2011).

Balancing loop 4 (B4). All commercial banks are always having a strategy against emerging situations, such as issuing a lot of NPLs loans. That's why, more NPL occurring will lead to the immediate higher credit risk of the bank, which means issuing less loans in whole to secure themselves in the nearest period.

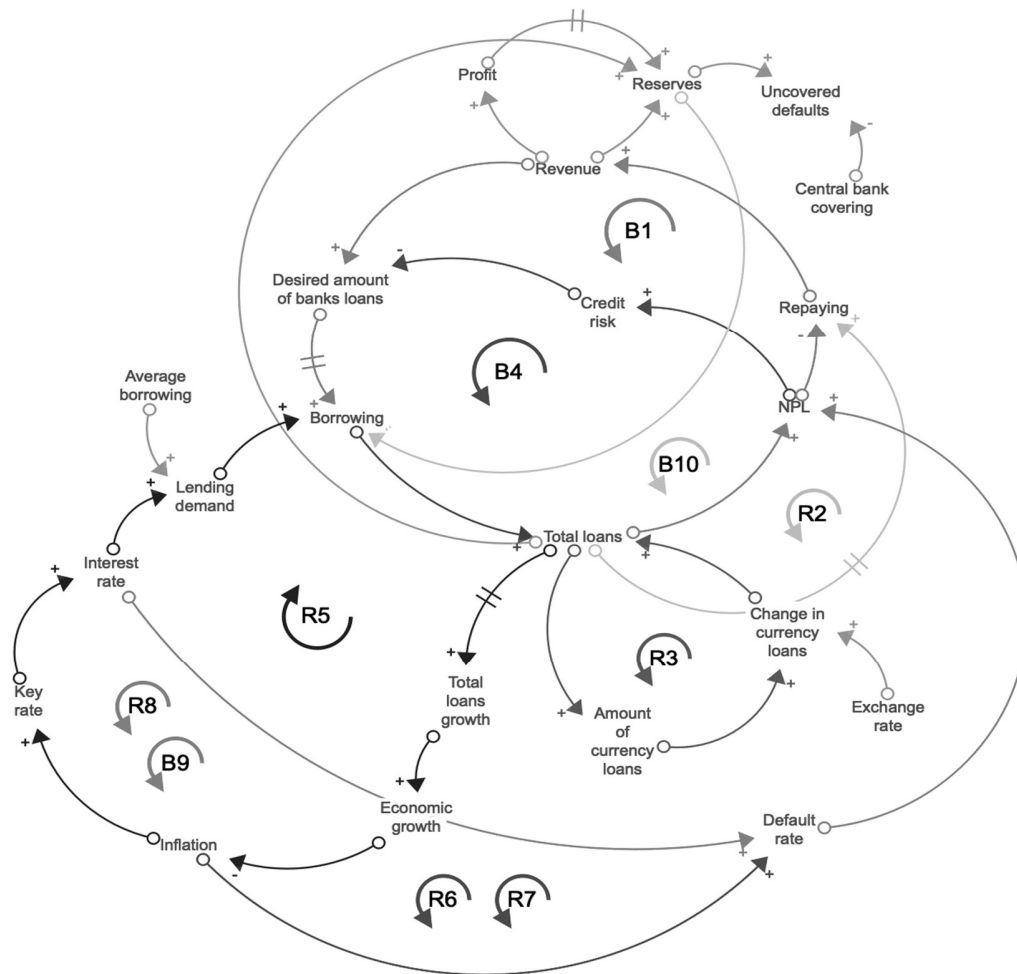


Figure 2. Causal Loop Diagram of NPLs in commercial banks of Ukraine

Source: Elaborated by the author using Stella Architect

Reinforcing loop 5 (R5). Total loans definitely lead to the total loans growth in the country, which means from the economic prospective improving the situation in whole. Since the inflation is inversely correlated with the economic growth, the National Bank of the country establishes the low key rate on the loans in case of the economic growth. As a result, the interest rate of the commercial banks will be also low, which in turn, has a great impact on the lending demand in the country.

Reinforcing loops 6&7 (R6 & R7). The increase in inflation reinforces the default rate, which then directly influences on the NPLs. According to this, the credit risk becomes higher as well as revenue goes down. However, both then lead to decreasing in the amount of money that banks are ready to lend. In turn, this forces to decrease the economic growth and increase inflation again in the country.

Reinforcing loops 8&9 (R8 & R9). With the increasing of the NPLs amount, the less total loans would be issued to the consumers and firms by the commercial banks of Ukraine. Consequently, the economic growth will be decreasing. However, from the other side, the devaluation of the national currency will occur. Eventually, the assumption here is that the rising of the default loans will force the National Bank to increase the key rate, which in turn increase the interest rate. The more NPLs are in the country – the higher is the interest rate, and hence less borrowing, due to unwillingness of the people to borrow money by the high rate.

Balancing loop 10 (B10). This balancing loop shows how the default loans are covered in the commercial banks of Ukraine. Firstly, each bank has its revenue, and then extracting the expenses – profit, from which then reserves are created and formed. The more reserves the bank has – the higher amount of money it is ready to lend. If there are a little amount of default loans – that means that the financial institution is ready to refill the reserves and offer higher amount of the loans to be issued. In turn, more NPLs would lead to these reserves to be spent to cover all default loans, which will then reduce the profit of the bank.

The model has identified several causal mechanisms that help NPLs to rise, such as: interest rate and inflation. Main dominants loops were studied through the whole modelling period and they are helping to reproduce the model results in the best way. This model was tested for the several tests, such as: structure confirmation test, parameter confirmation test, dimensional consistency test, extreme condition test, integration error test and behavior sensitivity test. Also, the model`s sensitivity to all parameters have been tested. Due to the result of the sensitivity analysis, it could be stated, that the model is sensitive for the average borrowing and maturity variables. However, as for fraction of currency loans it could be seen, that the model is not sensitive for tis variable.

The model results have quite same patterns as the reference mode. However, for the future developing, there could be included the following factors: COVID-19 influence on the Ukrainian economy, replacing of government in 2014 and changing of the policies and also the updating consequences of the war in Ukraine from February 24, 2022. As the model gives similar results to the reference mode, the proposed policy could be considered for implementation in future to prevent damaging of NPLs to banks as it were in stated periods.

References:

1. European Central Bank review. The dynamics of non-performing loans during banking crises: a new database. 2020. URL: <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2395~834e0e7137.en.pdf>
2. Лук'яненко І. и др. Системний аналіз формування державної політики в умовах макроекономічної дестабілізації. 2017.
3. Офіційний сайт НБУ. URL: <https://bank.gov.ua/ua/statistic/supervision-statist>
4. Прімерова О., Кісельова Г. Застосування апарату нечіткої логіки для оцінки рівня банківського ризику. 2016.