

# Behavioral Significance in the Credit Decision Making Process

Roxana Elena CRISTEA<sup>1</sup>, Petre BREZEANU<sup>2</sup>

<sup>1,2</sup> The Bucharest University of Economic Studies

**Abstract.** Behavioral finance research is an attempt to close the gaps in traditional theory, to maximize the expected usefulness of rational investors in effective markets by trying to justify human behavior. A fundamental assumption in behavioral finances is that both the information structure and the characteristics of market participants systemically influence individual investment decisions as much as market results. The investor, as a human being, processes information using shortcuts and emotional filters. This process influences those who make financial decisions in such a way that they act apparently irrationally and choose decisions below the optimal threshold, in violation of effective traditional financial assumptions. The impact of this decision below the optimal threshold has ramifications for capital market efficiency, personal wealth and corporate performance. Behavioral finance focuses on how investors interpret and use information so that they make investment decisions based on real information.

**Keywords:** finance, analysis, behavior, credit, economic

**JEL Classification:** G4 - Behavioral Economics

## 1. Introduction

The financial system involves a set of complex and closely connected institutions, agents, practices, markets, transactions, claims and liabilities in the economy. It can be classified into two categories namely banking and non-banking institutions. The bank had not penetrated the rural and semi-urban areas and institutional credit was not available to agriculture, small industries, independent entrepreneurs, artisans and small traders. Non-banking institutions also play a major role and are an integral part of the financial system. A development bank is a financial intermediary that provides medium and long-term funds for banking economic development projects and provides related services. It is defined as an institution wholly or partly owned by the government or by private interest, dedicated primarily to stimulating and revitalizing the national capital market, providing long-term capital and providing entrepreneurship, including private sector management. A development bank is meant to provide the necessary managerial and technical know-how and help build the financial and socio-economic infrastructure conducive to rapid economic growth.

## 2. Theoretical aspects regarding the definition of lending behavior

Indebtedness is a planned and rational decision that allows the intertemporal redistribution of consumption. However, there is evidence of cognitive bias, where our financial decisions are influenced more by our emotions, attitude and behavioral traits than by logical thinking. To understand financial decision-making under unpredictable conditions, during the development of behavioral economics for over 20 years, individual behavior and attitude have been closely observed by behavioral economists based on psychological research works. As defined within behavioral economic theories there are two types of systems:

- System 1 - the human model of automatic thinking.
- System 2 - the human model of mechanical thinking.

These types of systems directly influence decision making. Since cognitive bias, thoughts and attitude are the internal factors that define the individual, it can be argued that the identification of the responsible borrower will be based on the psychological study of the individual. According to the dispositional approach, individuals have stable traits that influence their behaviors. These traits are primarily unobservable characteristics or mental states, such as values, needs, or personalities. From this perspective, it can be said that personality and psychological states can have an effect on an individual's debt repayment behavior. Furthermore, in the literature, it is argued that demographic and economic factors are not sufficient to explain the debt repayment behavior of individuals. Psychological factors must be considered to understand and explain these behaviors. Furthermore, psychologist Sara Hampson defined the individual's psychological processes, such as thoughts, emotions, motivations, and perceptions, as the mechanism that develops the influence of the individual's personality traits over time. It could be expected to explain personality traits if the internal processes of the individual were well studied. All things considered, Sara Hampson's survey distinguished the differences between responsible and high-risk borrowers with overdue loans and missed payments. Loan repayment behavior can be analyzed with an emphasis on their causes. This type of work is devoted to the search for predictors of debt behavior, which include, for example, self-control and time perspective (Nyhus, E.K.; Webley P. - 2001). However, it is not always possible to distinguish the relationship between the internal characteristics of individuals and the accumulation of debt. Some work has argued that low self-control leads to greater indebtedness, as respondents with low self-control often take out short-term but expensive loans, and increased debt is due to low self-control, not financial literacy (Gathergood, J.; Disney RF – 2011).

According to research conducted by the Organization for Economic Cooperation and Development in 2012, financial discipline correlates with actual financial acts, while actual financial acts are associated with positive attitudes toward money. Some of the research indicators that prove the above hypothesis include the following: a higher level of income and neurosis of the individual indicates that they are more likely to overcome their outstanding loans, adventurous people are inclined to go into debt, people who are conscious of their savings and of controlling their spending tend to spend money in a more controlled way, people without financial education are more likely to have higher debts.

According to some studies, our thinking process contains intuitive sense and is easily affected by heuristic approach. Thus, people tend to be overconfident in their decisions (Kahneman D. - 1982). The most palpable example of an emotional and short-term decision is the act of buying unnecessary items on a sentimental background. Under exactly the same principle, the most ineffective financial decisions are made. Therefore, applying consciousness and logically overcoming selections based on emotional terrain, or as defined by Daniel Denneth using the brain mechanically, will be advantageous. As a result, individuals will gain the ability to control their debt payment rate and still become debt free and allocate a certain percentage of their budget to purchase the items they want. Despite the natural limits of human cognitive capacity and a wealth of literature on the role of bias in decision-making and behavior in general, there has been surprisingly little research related to cognitive biases and systematic errors in the heuristics (shortcuts) that we specifically use in our thinking and judgments about lending.

Paying off the loan on time and being able to save money and avoid impulsive purchases are the characteristics of the financially disciplined individual. Among the Big Five personality traits, conscientiousness is positively correlated with financial discipline, while neuroticism is negatively correlated with financial discipline. Some research findings have suggested that borrowers have lower levels of

conscientiousness, debt avoidance, and rational debt behavior than borrowers/payers and non-borrowers.

A conscientious individual is more likely to focus on the future and be able to incorporate a vision of the future into their actions. Financially, they are more self-controlled, and this characteristic influences their financial discipline the most. Individuals with this type of personality trait are advantageous for being responsible towards themselves, comparable to being conscientious towards others. Some researchers have determined that conscientious people can accumulate savings dedicated to their health and retirement, and are less affected by the financial pressure of youth by having a better credit history.

A generous and charitable attitude means giving financial and material support, spending time, caring, and helping, motivating and emotionally supporting other people. The mesolimbic pathway is sometimes referred to as the brain's reward pathway that activates when a person helps or gives to others, similar to eating or laughing. Similar to feeling happy for any pleasurable action, a person feels satisfaction after helping others. In other words, charitable people are predominantly happier with a stable psychology and have a gentler approach. We assume that people who prefer not to spend money on others are likely to have less motivation to repay the loan. However, some studies have found that people are happier when they spend money on others than on themselves, due to the higher level of endorphins produced. People who cannot spend money on others and who tend to hold grudges, we can assume that they will not want to pay back the money borrowed from the bank. According to the discussed hypothesis, generous or charitable people have a higher intention to repay the loan.

Bank loans are one of the most important sources of long-term financing in many countries. Commercial banks attract the savings of the population and at the same time grant financial resources to both individuals and institutions in need. Consequently, these roles contribute to economic growth and development. In fulfilling this role, we must realize that banks have the potential, scope and prospects to mobilize financial resources and allocate them to productive investments (Olokoyo, 2011).

Olokoyo (2011) further noted that regardless of the sources of income generation or economic policies of the country, commercial banks would be interested in providing loans and advances to as many customers as possible, keeping in mind the three principles that guide operations, which are, profitability, liquidity and solvency. Credit institutions play a major role in economic growth and development by granting loans to enable economic activities to be carried out. However, the major concern of any lender when granting credit is how they will recover their money (Foluso, 1998) and this implies that the commitment between lenders and borrowers is accompanied by a certain level of risk.

According to some studies, in the theory of money supply, banks create deposits for which interest is not paid, in order to make loans for which interest is earned (Branson - 2004). Deposits are created in the process of granting credits; a credit is credited to the debtor's account. Thus, the incentive to increase deposits lies in the possibility of making profitable loans. When the demand for loans by a potential borrower decreases, banks may not create deposits up to the maximum limit that reserves would support. Thus, they may have surplus reserves from time to time. On the other hand, when loan demand is particularly strong, banks may call on reserves to support the creation of additional deposits that accompany the increase in loans. This degree of freedom that banks have to hold excess reserves or to lend reserves makes the money supply respond, to a certain extent, to loan demand and the interest rate. When the demand for loans is high and interest rates are high, banks will use excess reserves and increase the money supply supported by a certain amount of unborrowed

reserves provided by the Federal Reserve System. Thus, the money supply itself will have a positive elasticity with respect to the interest rate, reducing the slope of the LM curve. Therefore, this theory will provide guidance in determining how the interest rate, among other factors, plays into determining the supply of credit by selected banks.

Most studies divide the factors that determine the lending behavior of commercial banks into two categories: internal and external factors (Olusanya et al., 2012; Tabila, 2016; Edewi et al., 2017). Internal determinants include profitability which is under the control of bank management and could be broadly classified into two: financial position variables and non-financial statement (Olusanya et al., 2012). Financial statement variables refer to those items on the balance sheet and income statement. And the non-financial variables have no direct relationship with the financial situation. External factors are those factors that should not be controlled by the bank's management, such as competition, regulation, market share, ownership, money supply, inflation. Consequently, most previous studies agree that it makes sense for banks to have some basic principles of lending to act as a control in their lending activities. There is a need to illuminate and consider some factors that economists and practitioners have proposed as practically significant in explaining the determinants of lending behavior of commercial banks (Olusanya et al., 2012). Therefore, commercial banks need to stock a reasonable quality of cash to meet customer demands.

Chodechai (2004) stated that commercial banks need to be careful in their lending interest rate decisions because they cannot charge loan rates that are too low because the interest income will not be enough to cover the cost deposits, general expenses and loss of income from some defaulting borrowers while using factors that affect interest rates, loan volume and collateral setting in banks' lending decisions. Moreover, charging too high loan rates can also create adverse selection and moral hazard problems for borrowers.

Laeven and Majnoni (2003) analyzed data from 45 countries to investigate the factors influencing loan loss provisioning and bank earnings reduction during the period 1988–1999. They found that banks that underprovision during good times in the cycle are forced to overreact during less favorable times.

Fonseca and Gonzalez (2008) focused on a similar issue: the determinants of income smoothing by managing loan loss provisions for banks in the whole world. They find that there is less reduction in bank earnings when investor protection is strong and where accounting disclosure, restrictions on banking activities, and official and private supervision are strong.

Messai and Jouini (2013) studied the determinants of non-performing loans in Spanish, Italian and Greek banks and found that NPLs increase when the unemployment rate and the real interest rate increase and decrease when the GDP growth rate and return on assets banks decrease. Before the financial crisis there was a significant increase in credit. This was largely due to the deregulation of financial markets and the development of information technologies in the banking industry (Panopoulou, 2005; Rinaldi and Sanchis-Arellano, 2006). Since the financial crisis, the trend has been reversed and banks are now less willing to lend. This has led to an academic focus on bank lending behavior (Micco & Panizza, 2006; Olokoyo, 2011; Swamy & Sreejesh, 2012; Ladime et al., 2013). The key determinants highlighted in these studies are bank-specific variables such as size, capitalization and macroeconomic variables such as GDP and monetary policy (Djiogap and Ngomsi, 2012; Ladime et al., 2013).

Keeton (1999) highlighted the close relationship between the business cycle and loan growth; specifically that loan advances tend to be high during economic expansion, while loan losses tend to be high during business contractions. It also showed that faster loan growth leads to higher loan losses. This is because during a good business cycle, banks are more likely to lend to customers with poorer credit

history even when collateral is low. The intertemporal relationship between loan growth and bank risk, especially credit losses, has been studied at the macroeconomic level in several aspects of the literature (Keeton, 1999; Borio et al., 2002), but there is little research on cross-sectional differences in relationship. There is little input on the relationship between bad loans and bank lending behavior.

In a study based on a sample of listed companies in China, the relationship between banks' lending behavior and non-performing loans is discussed (Lu, D., Thangavelu, S.M.&Hu, Q. - 2005). The authors showed that the banking sector is biased in China, as banks are more likely to lend to state-owned firms, even though they may have high credit risk. Borio et al. (2002), in a study based on a sample of Spanish banks, pointed out that during the recession, non-performing loans increase as a result of the financial distress of firms and households. When the economy is growing, firms take out more loans and can repay them more easily, but when the economy stops, firms have more difficulty repaying debt.

### **3. Nonperforming loans and the impact on the economy**

High levels of non-performing and outstanding loans are associated with deeper recessions and slower recoveries (Ari et al., 2020a, b). Banks play a key role in this. As pointed out by Huljak et al. (2020), high NPL rates can negatively affect the soundness of the banking system and its ability to lend to the real economy. High NPL ratios reduce banks' profits because they require higher provisions, reduce interest income, generate higher monitoring burdens, and lead to higher funding costs due to banks' higher credit risk. Second, non-performing loans have higher risk weights, thereby increasing capital requirements that may cause banks to reduce leverage, leading to a contraction in credit supply. Indeed, empirically the findings of Huljak et al. (2020) for 12 euro area countries suggested that an exogenous increase in the NPL ratio tends to weaken bank lending (especially bank lending to non-financial corporations), widens lending spreads and leads to a decline in real GDP growth and residential real estate prices.

High NPL rates have been a concern in several European countries since the 2008-2012 crisis. The non-performing loan ratio in the euro area peaked at around 8% in 2014. The economic recovery in the second half of the decade helped to reduce the non-performing loan ratio in the euro area. According to the EBA (2020b), the NPL ratio in the EU was in June 2020 at 2.9%, i.e. around 50 bps lower than in June 2019 and 20 bps lower than in December 2019. In June 2020, total non-performing loans stood at EUR 528 billion, 10% less than a year ago (EUR 581 billion). In June 2020, non-performing loans of non-financial firms and households accounted for more than 95% of total NPLs and reached EUR 510 billion.

However, the stock of non-performing loans differs widely from country to country. According to the EBA (2020b), France reported the highest volume of non-performing loans (€127 billion) in June 2020, followed by Italy with €108 billion (€29 billion less than in June 2019). Greece (30.3%) and Cyprus (15.5%) reported the highest NPL rates.

The COVID-19 pandemic and the related containment measures are often argued to lead to an increase in the rate of non-performing loans in the coming years. As pointed out by the European Commission (2020), banks are exposed to companies and individuals that have become more financially vulnerable, especially small and medium-sized enterprises (SMEs) and specific industries (such as transport, tourism and hospitality).

Ari et al. (2020a) analyze the evolution of non-performing loans during 88 banking crises in 78 countries since 1990. Two important conclusions emerge from their analysis. First: pre-crisis NPLs are not a good indicator of future NPL problems.

NPL rates typically follow an inverted U-shaped pattern during crises, meaning they start at modest levels, rise rapidly around the onset of the crisis, and peak for several years afterward before leveling off and declining. Second: macro and banking conditions help predict future NPL problems.

Researchers have shown that, in Spain, bank lending is strongly procyclical and that, in periods of expansion, banks are more likely to lend to firms with poor credit quality (Borio, C., & Drehmann, M. - 2009) . This leads to future problems and default, usually during recessions, with an estimated lag of about three years.

Berrospeide and Edge (2010) studied the impact of bank capital on bank lending behavior as measured by loan growth and found that the level of capital has little effect on lending. Bridges et al. (2014) investigated the effects of a change in bank capital requirements on lending behavior. Their results suggested that changes in capital requirements affect both equity and loans. In response to an increase in capital requirements, banks gradually increase their capital ratios to restore their initial write-downs held above the minimum regulatory level. Banks are also reducing loan growth, which is mostly back to normal within 3 years. Finally, the determinants of bank loan behavior on a sample of Turkish banks were studied and a significant relationship was identified between non-performing loans and bank loan behavior in state-owned banks, and non-performing loans have a negative impact on total loan growth (Tomak, S. - 2013).

Stress tests have become well-established tools by authorities to assess the resilience of individual banks and the banking sector, particularly after the Great Financial Crisis. Stress tests are forward-looking exercises aimed at assessing the impact of severe but plausible adverse scenarios on the resilience of financial institutions. Originally developed with a focus on individual banks, they were first used in a systematic way and with a financial sector perspective by the International Monetary Fund (IMF) and the World Bank starting in May 1999 as part of their Program evaluation of the financial sector. (FSAP).

Sector-level stress tests differ widely in their design and implementation. A comparison of practices shows that authorities develop resistance tests in different ways, some using more than one type of test. To better understand these differences and their drivers, the Institute for Financial Stability conducted a comparative analysis, for which detailed information was collected from selected authorities around the globe. In particular, the review covered system-wide stress testing practices for banks, i.e. stress tests covering a significant part of the banking sector in the euro area, Japan, Switzerland and the United States. Stress tests can have a microprudential or macroprudential policy objective. In a stress test with a microprudential objective, the exercise, albeit system-wide, focuses on assessing the resilience of individual banks, providing authorities with information on how banks should take remedial measures (such as increasing capital regulation, reducing risk exposures or improving their capital planning processes). In turn, stress tests with a macroprudential objective focus on system-wide risks and their aggregate impact. They can also be used by authorities as input for calibrating macroprudential measures. In exceptional circumstances, i.e. in times of systemic financial crisis, stress tests can be and have been used to provide information on recapitalization needs for both individual banks and the banking system, and can also help restore market confidence.

For the banking sector, stress tests are simulation exercises carried out to assess the resilience to a hypothetical scenario of either a single bank or the system as a whole. The IMF (2012) described stress tests as a quantitative “what if” exercise to estimate the resilience of banks or financial systems as a whole should certain shocks materialize. In general, there are two types of tests: system-wide stress tests performed by central banks and/or supervisory agencies, and stress tests that focus on individual banks and may be performed by banks or supervisors themselves.

Stress tests addressing bank solvency have become an important supervisory and policy tool. System-wide stress tests emerged as a key risk management tool to guide bank recapitalization, particularly after the Great Financial Crisis. The emphasis on stress tests to assess and supplement the bank's solvency was justified by the fact that capital is at the heart of a bank's ability to absorb losses and continue lending. Solvency stress tests help assess banks' capital planning as well as their capital adequacy, thereby reducing the likelihood of failure. Stress tests could also focus on liquidity, examining whether a bank has sufficient cash inflows to withstand cash outflows in a stress scenario.

The rise of credit fraud has become the predominant problem disrupting the normal activities of the economic market (Longstaff et al. 2005; Prati et al. 2012). The best-known cases of credit fraud are the US subprime crisis and the European sovereign debt crisis that caused substantial damage to global economic systems. Such devastating effects increase the need for social credit study to assess credit risk (ie, credit rating or credit scoring) and to avoid subsequent credit fraud. Credit fraud has become a predominant topic of attention for academic researchers and practitioners in the fields of economic and financial management.

Credit risk reveals the likelihood that borrowers will renege on promises (in terms of contracts). Similarly, when trading in commodity markets and investing in financial markets, the ability of target corporations or individuals to meet their debt obligations should be carefully estimated by credit score or rating using information about history, current economic status and other attributes (Huang et al. al. 2004; Huang et al. 2006). For example, commercial banks make financial lending decisions and issue credit cards to customers that depend on corporate (or individual) credit ratings or credit scores. Moreover, the rapid development of online markets has facilitated economic activity through networks, and the new concept of network credit has sparked an ever-wider interest in assessing the credit risk of corresponding participants based on large amounts of historical data online (Xu and Zhang, 2009).

#### **4. Conclusions**

Credit evaluation is one of the most crucial processes in banks' credit management decisions. This process includes the collection, analysis and classification of various credit elements and variables to evaluate credit decisions. The quality of bank loans is the key determinant of competition, survival and profitability. One of the most important tools to classify a bank's customers as part of the credit assessment process to reduce the current and expected risk of a customer defaulting is scoring. Hand & Jacka, (1998) stated that "the process (by financial institutions) of modeling creditworthiness is called credit scoring".

Credit scoring for quantifying the credit risk of various agents has been and remains the major concern in social credit. To increase the accuracy of the assessment, various prediction techniques have been formulated and introduced, which can be classified into four groups: expert system approaches (Altman, E.I. - 1968), traditional econometric models (Douplos et al. 2001), intelligence techniques artificial (Blanco et al. - 2013), and their hybrids (Yim and Mitchell 2005; Lee et al. 2002). Moreover, explanatory variables (or rating indices) play an important role in credit rating prediction and vary between different target agents. For example, country risk includes the economic, financial, social, cultural, geographic and political domains of a country and extends to its relationship with other countries (Li et al. 2012a; Balkan 1992; Block and Vaaler, 2004). Corporate credit rating indices can be divided into financial and non-financial indicators (Duffee and Zhou, 2001).

The credit score is the assessment of the risk associated with the loans of an organization or a consumer (a person). When evaluating credit, depending on the context we can summarize different types of scoring as follows:

- ✓ Application score (credit): refers to the assessment of creditworthiness for new applicants. It quantifies implicitly, associated with credit applications, through questions on the application form, for example, current salary, number of dependents and time at current address. Typically, a credit score is a number that quantifies a person's creditworthiness;

- ✓ Behavioral scoring: It involves principles that are similar to application scoring, with the difference that it refers to existing ones. The use of behavioral scoring models refers to historical customer data, for example, account activity, account balance, delinquency frequency and account age;

- ✓ Collection Score: It is used to divide customers with different levels of insolvency into groups, separating those who require more decisive action from those who do not need immediate assistance. These models are distinguished according to the degree of delinquency (early, medium, late recovery) and allow better management of delinquent customers, from the first signs (30-60 days late) to the later stages and cancellation of debts;

- ✓ Fraud Detection: Fraud scoring models rank applicants based on the relative likelihood that an application is fraudulent.

## References

Abdou, H., Pointon, J. 2009. Credit scoring and decision-making in Egyptian public sector banks. *International Journal of Managerial Finance*. <https://www.researchgate.net/> accesat 12.12.2021.

Al Amari, A. 2002. The credit evaluation process and the role of credit scoring: A case study of Qatar. Ph.D. Thesis, University College Dublin. <https://www.researchgate.net/> accesat 20.12.2021.

Altman EI (1968) Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *J Finance*. <https://www.researchgate.net> accesat 12.12.2021.

Blanco A, Pino-Mejías R, Lara J, Rayo S (2013) Credit scoring models for the microfinance industry using neural networks: evidence from Peru. <https://www.sciencedirect.com>.

Borio, C., & Drehmann, M. (2009). Assessing the risk of banking crises – revisited. *BIS Quarterly Review*. <https://www.sciencedirect.com> accesat 18.12.2021.

Beynon, M. J. 2005. Optimizing object classification under ambiguity/ignorance: application to the credit rating problem. *Intelligent Systems in Accounting, Finance and Management*.

Bellotti, T., Crook, J. 2009. Support vector machines for credit scoring and discovery of significant features. *Expert Systems with Applications*. accesat 10.02.2022.

Berrospide, J. M., & Edge, R. M. (2010). The effects of bank capital on lending: what do we know, and what does it mean. *Financial and economics discussion series*. Federal Reserve Board. Washington, D. C. <https://www.sciencedirect.com> accesat 10.02.2022

Cumhur Erdem, Factors Affecting the Probability of Credit Card Default and the Intention of Card Use in Turkey, *International Research Journal of Finance and Economics*. <https://www.researchgate.net> accesat 05.02.2022.

Djiogap, C. F. & Ngomsi, A. (2012). Determinants of bank long term lending behavior in the Central African Economic and Monetary Community (CEMAC). *Review of Economics and Finance*. <https://www.researchgate.net> accesat 08.02.2022.

Durand, D. 1941. Risk Elements in Consumer Instalment Financing, *Studies in Consumer Instalment Financing*. New York: National Bureau of Economic Research. <https://www.researchgate.net> accesat 10.02.2022.

- Duffee GR, Zhou C (2001) Credit derivatives in banking: useful tools for managing risk? *J Monet Econ*. <https://www.researchgate.net/> accesat 10.02.2022.
- Fisher, R. A. 1936. The Use of Multiple Measurements in Taxonomic Problems. *Annals of Eugenics*. <https://www.researchgate.net/> accesat 10.02.2022.
- Greene, W. 1998. Sample Selection in Credit-Scoring Models. *Japan and the World Economy*. <https://www.researchgate.net/> accesat 10.02.2022.
- Gup, B. E., Kolari, J. W. 2005. *Commercial Banking: The management of risk*. Alabama: John Wiley & Sons, Inc. <https://www.researchgate.net/> accesat 03.02.2022.
- Huang Z, Chen H, Hsu CJ, Chen WH, Wu S (2004) Credit rating analysis with support vector machines and neural networks: a market comparative study. *Decis Support Syst*. accesat 08.02.2022.
- Huljak, I., Martin, R., Moccero, D. and Pancaro, C. (2020a). Do non-performing loans matter for bank lending and the business cycle in euro area countries. *ECB Working Paper 2411*, European Central Bank, Frankfurt. <https://www.researchgate.net> accesat 10.02.2022.
- Keeton, W. R. (1999). Does faster loan growth lead to higher loan losses. *Economic review* Federal reserve bank of Kansas City, 57-75. <https://www.sciencedirect.com> accesat 16.01.2022.
- Kahneman, D.; Tversky, A. *Intuitive Prediction: Biases and Corrective Procedures*; Cambridge University Press (CUP): Cambridge, UK, 1982. <https://www.researchgate.net>.
- Lu, D., Thangavelu, S. M. & Hu, Q. (2005). Biased lending and nonperforming loans in China's banking sector. *The Journal of development studies*. <https://www.researchgate.net>.
- Lusardi, A., and P. Tufano (2015), "Debt Literacy, Financial Experiences, and Overindebtedness", *Journal of Pension Economics and Finance*. <https://www.researchgate.net/> accesat 10.02.2022.
- Lee, T., Chiu, C. Lu, C., Chen, I. 2002. Credit Scoring Using the Hybrid Neural Discriminant Technique. *Expert Systems with Applications*. <https://www.sciencedirect.com> accesat 26.02.2022.
- Lim, M. K., Sohn, S. Y. 2007. Cluster-Based Dynamic Scoring Model. *Expert Systems with Applications*. <https://www.researchgate.net> accesat 10.02.2022.
- Lee, T., Chiu, C. Lu, C., Chen, I. 2002. Credit Scoring Using the Hybrid Neural Discriminant Technique. *Expert Systems with Applications*. <https://www.researchgate.net> accesat 19.02.2022.
- Lee TS, Chiu CC, Lu CJ, Chen IF (2002) Credit scoring using the hybrid neural discriminant technique. *Exp Syst Appl*. <https://www.sciencedirect.com> accesat 10.02.2022.
- Laeven, L., & Majnoni, G. (2003). Loan loss provisioning and economic slowdowns: too much, too late? *Journal of Financial Intermediation*. <https://www.sciencedirect.com> accesat 10.02.2022.
- Nur Asyiah Jalil , *Analisis Preferensi Dosen Terhadap Kartu Kredit*, Institut Pertanian Bogor, 2007. <https://www.sciencedirect.com> accesat 25.02.2022.
- Orgler, Y. E. 1970. A credit scoring model for commercial loans. *Journal of Money, Credit and Banking* II (4): 435-445. <https://www.sciencedirect.com> accesat 18.02.2022
- Sustersic, M., Mramor, D., Zupan J. 2009. Consumer credit scoring models with limited data. *Expert Systems with Applications*. <https://www.sciencedirect.com> accesat 15.02.2022.
- Thomas, L. C., Edelman, D. B., Crook, L. N. 2002. *Credit Scoring and Its Applications*. Philadelphia: Society for Industrial and Applied Mathematics. <https://www.researchgate.net>.

- Block SA, Vaaler PM (2004) The price of democracy: sovereign risk ratings, bond spreads and political business cycles in developing countries. *J Int Money Finance*. <https://www.researchgate.net> accesat 25.01.2022.
- Xu Y, Zhang Y (2009) A online credit evaluation method based on AHP and SPA. *Commun Nonlinear Sci Numer Simul*. <https://www.sciencedirect.com> accesat 28.01.2022.
- Hand, D. J., Jacka, S. D. 1998. *Statistics in Finance, Arnold Applications of Statistics*: London. <https://www.sciencedirect.com> accesat 10.02.2022.
- Longstaff FA, Mithal S, Neis E (2005) Corporate yield spreads: default risk or liquidity? New evidence from the credit default swap market. *J Financ*. <https://www.sciencedirect.com> accesat 10.02.2022.
- EBA (2020b). The EU banking sector: First insights into the COVID-19 impacts. <https://www.researchgate.net>, accesat 15.01.2022.
- Fonseca, A. R., & Gonzalez F. (2008). Cross country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking and Finance*. <https://www.sciencedirect.com> accesat 15.01.2022.
- Panopoulou, M. (2005). *Technological Change and Corporate Strategy in the Greek Banking Industry*. Athens: Center of Planning and Economic Research. Working Paper n. 02-13. <https://www.researchgate.net> accesat 25.01.2022.
- Olokoyo, Felicia O.(2011), Determinants of Commercial Banks" Lending Behavior in Nigeria, *International Journal of Financial Research* Vol. 2, No. 2; July 2011 <https://www.sciencedirect.com> accesat 30.01.2022.
- Olokoyo, Felicia O.(2011), Determinants of Commercial Banks" Lending Behavior in Nigeria, *International Journal of Financial Research* Vol. 2, No. 2; July 2011, <https://www.sciencedirect.com> accesat 28.01.2022.