FINANCIAL MARKET ANALYSIS MODELS

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Abstract
Operational risk management is associated with financial and banking activities and is defined and described through its components under the new Basel Accord. The quantification methodology is also presented, as well as the importance of internal banking control as a fundamental tool in operational risk management. The investment dynamics, closely related to operational risk, captures the way in which risks are assumed in the future, indicating from the perspective of HARA preferences that risk-taking for the future has no effect on optimal risk exposure today. Moreover, from the perspective of the dynamic portfolio of financial instruments, investors are characterized by a vision of their own investments over a longer period of time. Taking long-term investment policies can generate significant benefits and benefits for investors, and the specificity of mutual funds is the focus on delivering relevant short-term benefits while retaining attention to long-term expectations.

Keywords: financial market, investment, portfolio, risk management, predictability

JEL Classification: E44, G11

Introduction
The mathematical modeling of any social process in general and financial processes in particular is an unlimited set of tools for analyzing phenomena that occur in the real space defined conceptually and agreed by specialists in order to deepen knowledge of the phenomenon and improve performance profile. Whether it is about increasing the efficiency of organizational activities, improving the financial performance of the overall financial framework or increasing investment efficiency over several decades, mathematical modeling has become indispensable for the development of theoretical research and the practical development of the field of the capital. The history of the theoretical research indicates a gradual expansion of both the conceptual approach and the complexity of the mathematical instrument used, or to elucidate aspects of the investment processes that escape the theoretical observation, given their eminently subjective character, such as the investor’s behavior, The motivation of which is subjective in its entirety, or because of
the subtlety of the general determinations of processes that compete with the complex and often ambiguous aspect of the processes that constitute what we call the „capital market” or „financial” market.

**Literature review**

Garfinkel and Hankins (2011) develop on the importance of risk management in some types of critical business transactions. Anghelache, Anghel and Popovici (2016) present the evolution of investments in the Romanian economy, outlining the significant dynamics recorded. Anghelache and Anghel (2014) develop on the application of regression methodology in the portfolios analyses and management. Osterman (2006) analyzes the effects of salaries on companies from the manufacturing sector, characterized by high performance. Anghelache and Anghel (2013) emphasize some patterns within the portfolio analysis methodology and activities. Emm, Gay, and Lin (2007) analyze the decisions and best practices in a key aspect of risk management at corporation level. Acemoglu, Johnson and Mitton (2009) have studied the financial development and contracting costs as factors influencing the vertical integration. Anghel (2013) develops on the configuration of portfolios, emphasizing the importance of selecting proper financial instruments to be included in its structure. Atkeson and Kehoe (2005) have approached the measurement and further modeling of the organization capital. Bade, Frahm and Jaekel (2009) have studied the optimization of financial portfolio under a Bayesian type modeling. Aebi, Sabato and Schmid (2012) are preoccupied by the influence of crisis on the banking business, from the viewpoints of performance, governance, risk, risk management. Stulz (2008) develops on the failures that occur within the risk management activity, he studies their characteristics and occurrence conditions. Almeida and Campello (2007) consider the corporate investment activity under the framework of financial constraints. Anghelache, Manole, Anghel, and Soare (2016) have developed a complex model, based on econometric and statistical methods, designed for the study of critical risks: operational and insolvency, Anghelache et.al. (2015) have approached the analysis models referring to the financial risk. Altig et. al. (2011) study the characteristics of capital within the business cycle. Anghelache, Manole and Anghel (2015) describe the usefulness of business intelligence in capital market specific analyses. Shenoy and Williams (2017) analyze the impact of trade credit on the financial structure of buyer and seller. Wulf (2007) considers the complex managerial system based on authority, risk, incentives conditioned by results. Anghelache and Anghelche (2009) affirm the role of risk and profitability as core pylons in financial analysis. Bhalla (2008) is a reference work in investment management. Ameur and

Research methodology and data
The capital market is an intermediary market, consisting of the link between issuers and investors. This relationship is not direct, being realized through financial investment companies (SSI) and credit institutions carrying out direct intermediation activities on the capital market. Intermediaries, in their turn, only provide financial investment services if capital requirements are met in accordance with market-approved legal regulations. Intermediaries are required to comply with prudential and conduct rules as well as capital adequacy requirements in line with Community law. Financial instruments are traded on regulated markets, on multilateral trading platforms or on alternative trading systems. Once the set of entities involved in these processes inherent in a capital market is defined, the system of relationships that make up the dynamics of the market, we can say, is one of the goals of most of the modeling efforts made over time in profile research. Obviously, the fundamental purpose of a capital market is generated around the concept of „investment.” Investment activities are the objective of mobilizing capitalization efforts. Like any initiative, in any field of activity, investing in one or another activity poses risks. The concept of Investment Risk has attracted the attention of researchers as a result of practical experience, of errors that have led to financial losses. Thus, the need to deepen the investment phenomenon from the perspective of
operational risk has been felt, and in the field of research there has developed a special field of research: operational risk management.

Operational risk has been defined as a specific risk associated with any economic activity, especially those in the financial-banking field. Managing this type of risk, the losses involving major financial imbalances, most often that investors can not afford most of the time, have become a necessity. Thus, following the current trend of globalization of trends and effects, and given the importance and need to create an appropriate overall framework for managing this type of risk, it was considered necessary to define a managerial framework that was formulated in accordance with the New Agreement Basel, which configures, among other things, the operational risk and its components, as well as its quantification methodology. Against the backdrop of significant losses, financial institutions have been forced to redefine their vision of operational risk. Managing this type of risk has failed through the use of control of its own analysis and internal audit, Banks being harshly criticized for not correcting risk models with the extreme market movements in recent years and not testing these models in response to exacerbated market fluctuations. Making investments in an optimized operational risk environment means avoiding large unpaid losses, avoiding a large number of smaller value peers, improving operational efficiency and return on capital, optimizing capital allocation, improving quality Customer service, pay more attention to all aspects of operational risk incidental to bank management, and manage more effectively information and human resources within the bank.

• Aspects regarding the methodology of research on operational risk issues

The main reason for investing in operational risk management is to avoid any unexpected loss and can be achieved by identifying the possibility of loss, whatever that may be. Difficulties may arise when we need to quantify the magnitude and probability of occurrence of a variety of events. These aspects have led to quantitative estimates of operational risk management by some banks. The formal normative consequence of this assessment was materialized in a series of documents on the „Operational Risk and Internal Control” elaborated by the Basel Committee on Banking Supervision, the practical consequence of which was the emergence of regulatory practices. According to these documents, operational risk is a magnitude risk for banks, which is why they need to own own funds to protect themselves against possible losses. Operational risk is a risk of loss resulting from procedural deficiencies or deficiencies caused by staffing by internal systems or by external events. The Committee has indicated a new vision on the calculation of adequate
own funds, based on rapid internal assessment techniques and improvement of operational risk management, as is the case with AMC - the approach to complex operational risk measures. Operative risk and its management is a constant objective of the Basel Committee, which closely follows developments in this concept and the practical effects of its theoretical developments in AMC operational risk manager practices. The management of these banks concluded that it is possible to formulate a supple and exhaustive vision of the quantification of operational risk related to the establishment of own funds limits. International banks that are exposed to an important operational risk and are required to adopt on a more timely basis AMC risk-sensitive methodology are targeted. Operational risk includes within the definition area several aspects among which risk categories to be reported and separately controlled in the context of risk (market and credit risk) management. At the local level, operational risk has already been managed within the legal and internal audit function, thus generating several risk categories, such as control risk, process risk, reputational risk, staff risk, legal risk, Risk of taking over, marketing risk, gaps in computer and communication systems, technological risk, changes in the tax system, changes in the regulations in the field, size of the business, project risk, security, additional risk management.

• **Quantification of operational risk**
  The chosen quantification method must meet certain requirements, including clear description of operational risk exposure, identification of risk factors and potential losses, establishment of a relationship between exposure to risk, risk factors and potential losses, moderation of low impact events and frequency High and high impact and low frequency impacts, as well as the formulation of the final model and reports and their inclusion in the business and management portions. Quantification by banks of operational risk can be made gradually when considering market or credit risk.

• **Dynamics of investments**
  The investment issue is a vast array of issues that relate to investor behavior and risk taking by investment decision. Whether the opportunity to take risky decisions on future investment influences investment decisions or not, especially when it comes to retirement, has always been a dilemma for those who have advanced but are still active as investors. The way in which future risk-taking influences short-term risk-taking is important, especially when decisions on retirement concern intermediate consumption. From the perspective of HARA preferences, risk-taking for the future has no effect on optimal risk exposure today. The risk-taking opportunity in the future increases
tolerance to current risks. A non-negative risk tolerance may be compatible with the following: the longer the time horizon, the longer the investment horizon should involve a more conservative investment in the short term. Also, when a long-term investment considers consumption at a given date, the investor’s change in risk exposure as the time horizon narrows is a problem of concavity, linearity or convexity of absolute risk tolerance. None of these conditions should apply to all welfare levels. Sometimes the risk tolerance is concave, sometimes it can be convex. For such cases and individuals, it is not possible to predict the effect of a larger planning horizon on investment strategies. The investments of such an individual will sometimes be directed into shares, sometimes in bonds, somehow chaotic, being a miopic investment. Generally, myopia is considered to be the optimal simplicity of the analysis.

- **Dynamic portfolio management**

  If the operational risk management directly targets banks as financial and financing institutions, dynamic portfolio management addresses the management of investment activities in general. Obviously, investors are entities that have a longer-term or short-term investment vision and, by their nature, investment decisions are irreversible, which brings some dynamics to discussion. In the context of this dynamics, the problem of mathematical modeling of the phenomenon arises, able to provide information for structuring a dynamic investment strategy. In other words, the objective of dynamic portfolio management is to determine the effect of the investment horizon of the investor on the risks associated with its portfolio. It is well known that a short-term time horizon generates overly conservative strategies. As private companies’ orientation towards long-term investment strategies is known to ensure a substantial benefit. Similarly, it is considered that mutual fund managers are focused on strategies that provide satisfactory short-term gains without sacrificing long-term expectations. The problem of the dynamic portfolio in a continuous time economy with HARA utility functions was Merton and Samuelson in 1969. Mossin (1968) demonstrated that HARA functions are the only ones for which myopia is optimal when there are no serial correlations of profits. In 2000, Barberis estimated the significant predictability of earnings generated by the US scholarship. The effect of profit predictability on the optimal structure of the initial portfolio is unexpectedly important. For an agent with 10-year risk relative aversion and 10-year time span, the optimal investment in shares represents 40% of the current welfare without predictability. It rises to 100% when reversing the means is taken into account. Detemple, in 1968, is the first to examine the issue of asset demand with incomplete information and knowledge. In 2010, Ameur and Prigent analyze risk behavior in the context of structured portfolio management. In 2013, Anghel deepens the key role of
identifying financial instruments in portfolios management, indicating later in 2014, 2015 and 2016, along with Anghelache, statistical and econometric tools, and the utility of the regression model in analyzing and managing the portfolio of financial instruments. Also important is the analysis of the risk-taking behavior launched by Eckhoud, Gollier and Schlesinger in 2005. Malcolm, Taliaferro and Wurgler (2006) analyze the possibility of forecasting investment income through managerial decision variables. The problem of the risk horizon is an extremely important aspect in setting portfolio strategies according to the age of the agent, since, as Samuelson observed in 1989, „as you age and your own investment horizon narrows, you will limit your initiatives to lucrative risky .. Obviously, the investment decision is dynamic, because all aspects of the investment decision-making environment are volatile, dynamic. The problems raised by the dynamic decision require a good understanding of the inverse induction method, which transforms any dynamic problem into a sequence of static problems through the value function.

• Predictability of portfolio management
  Further developments of any system are predictable. Portfolio management needs predictability techniques to access opportunities. These are stochastic embedded, which allows for predictable state changes, including the correlation between benefits and shares. The predictability of optimal portfolio management becomes the goal of any investor who follows a flexible strategy based on an optimal risk exposure. Thus, investors will try to anticipate possible shocks that affect the range of opportunities associated with that investment. More specifically, they recognize the possibility of avoiding any negative news about the future series of opportunities, the so-called „myopia” relative to the time horizon, when predictability is possible. This circumstance is part of the risk aversion. We can say that predictability has the same effect as reducing aversion to risk. In theory, a portfolio management issue will face a determined, non-variable opportunity in time. In reality, the opportunity is determined in a stochastic manner, with certain changes in the predictable state. For example, predictability is possible in the case of a correlation between earnings and shares. Thus, there is a type of resource reversibility in the case of benefits of accepted actions. Lately, an increased capitalization generated by a risky portfolio today implies a diminished capitalization. In other words, good news today brings less good news in the future with reference to opportunities.

• Predictability and optimal portfolio dynamics
  Exposure to risky decisions is always associated by investors with some strategic investment flexibility as part of the opportunity organizing
process and involves anticipating any potential shocks emerging within the set of opportunities. This process is not difficult if the changes made are statistically correlated with the current benefits. Due to this anticipation, the application for action is called „request for coverage” for actions. As stocks are considered secure only in the short term, the intuition suggests that an investor with a longer planning horizon will assume more risks earlier in life than one with a shorter planning horizon. Risk decisions on the portfolio are involved in share-related management activities. Consider that a set of opportunities is important for an investor managing risky assets. In theory, predictability has not shown interest given the lack of assumption of a time horizon. In everyday life, opportunities and management are possible and explain the state changes of a process in stochastic expression. Thus, some state changes could be predictable in terms of the correlation between profit and the volume of shares. The predictability of portfolio management becomes the goal of any investor who follows a flexible strategy based on optimal risk exposure. So, investors will try to anticipate the possible shocks that affect the set of opportunities for their investment. In particular, they will admit the possibility of covering any bad news regarding the future of the set of opportunities, the so-called „myopia” relative to the horizon of time when predictability is possible. This situation is part of the realistic aversion to risk. When the relative aversion to risk is greater than the unit, the demand for hedging for risky assets is positive, which means that the time horizon is lower. In the presence of predictability, myopia is the optimal solution for investors. With this in mind, we can say that predictability has the same effect as reducing aversion to risk.

**Conclusion**

Operational risk management is a critical process that influences the conduct of banking activities to avoid financial losses. Under the new Basel Accord, banks need to have their own funds to properly manage operational risk. This is an extremely complex phenomenon, taking into account its components, and should not be ignored. The effects of operational risk ignorance involve hard-to-recover financial losses such as image damage, security-related events, etc. Measurement, adequate quantification of operational risk and rigorous application of procedures associated with the internal control process are sine qua non conditions for professional banking management. In terms of investment dynamics, the investment issue is a vast array of issues that focus on investor behavior and risk-taking through investment decisions. The way in which future risk-taking influences short-term risk-taking is important, especially when decisions on retirement concern intermediate consumption. From the perspective of HARA preferences, risk-taking for the future has no effect on optimal risk exposure today.
The investor’s tolerance to investment risk is an aspect of the investment equation subordinated to the time horizon. If the predictability of investment processes is timeless, instead, the investor’s financial behavior is determined by its reporting over the time horizon. Thus, the investor will sometimes invest more in shares, and in other periods he will invest more in securities that will be invested under conditions of investment short-sightedness. We can appreciate the convexity / concavity of absolute tolerance to risk through introspection. Most theoretical models of financial analysis use the HARA utility functions. In these models, investment myopia is optimal, which greatly simplifies analysis. Someone may still suspect that this assumption is made to simplify things, thus departing from the reality under analysis. On the other hand, the econometric tests for HARA preferences are extremely few as specialized literary resources.

References