

Supply Chain Finance Application for Improving the Economic Status of the Small and Medium Sized Enterprises

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Abstract- In the current highly competitive and fast-changing business environment, in which the optimization of all resources matters, creating an efficient supply chain is crucial. The article examines supply chain finance in economic environment for small and medium sized enterprises (SMEs). This article discusses the main aspects of supply chain finance. The authors describe various theories presented in the works of researchers in this area of financial learning. The issues of making financial decisions, the possible behavior of investors and the external and internal influence of various factors in the process of making these decisions are raised. The article notes that in modern finance, traditional methods of analysis and forecasting do not give a full explanation of the studied financial events. In this regard, when formulating conclusions and summarizing the final calculations, financiers are increasingly talking about the need to study the supply chain finance factors that underlie financial decision-making.

Keywords: Supply Chain Finance, Economy System, Smes, Financial Market, Information, Decision, Risk.

1. Introduction

At the present stage, under the influence of the development of related sciences, a large-scale shift in the scientific paradigm of finance is taking place. This problem is now common to all areas of knowledge. There are many reasons for this, and the main ones are international integration in science and the emergence of new technologies and innovative approaches to traditional scientific problems. The more science develops, the newer questions arise.

On March 14, 2008, the Second Annual Honorary Lecture by Morgan Stanley, held by Yale Professor and author of the famous books *Irrational Exuberance* and *New Financial Order* Robert Schiller, was held at the MICE. Noting the presence of a severe financial crisis on a global scale, the professor noted his connection with the psychology of the masses. According to the American expert, the current state of economic theory is characterized by a rapid increase in interest in the socio-psychological aspects of the structure of financial flows - the so-called "supply chain finance". This topic is especially relevant for those countries whose economies are experiencing rapid growth (the so-called BRIC group: Brazil, Russia, China, India).

Over the past few decades, the Nobel Prize in Economics has been awarded several times for work at the intersection of the economy itself with sociology, social

psychology and personality psychology.

Generally, the history of the development of economic doctrines demonstrates a clear tendency toward a rational beginning in the models of man and his economic behavior. Starting with A. Smith, a person appears as a "competent egoist" striving to make economic decisions in the most logical and reasonably justified way possible. Deviations from the rational principle are considered as annoying obstacles, distortions of the "right" approach to economic processes, evidence of the imperfection of human nature [1-6].

However, an objective view cannot fail to note that irrational economic behavior at all levels is more a rule relating to the vast majority of cases than a rare exception.

In our opinion, the key to understanding modern economic structures is the inclusion of human management in the sphere of economic analysis.

The cost of management is quite high. So, buying a movie ticket for 100-500 rubles, the viewer actually buys the opportunity to experience valuable management for him within a half to two hours. Thus, the price of positive management in the Russian entertainment market is 60-300 rubles/hour. In fact, the cost of management is even higher, since the price of a movie ticket includes the price of risk that the film will not be liked.

The analysis of modern markets of management (supply chain finance) is a necessary element in modeling the structure of financial flows both globally and regionally. The nature and dynamics of management prevailing in one or another national or local culture makes sense to take into account in planning the development of a post-industrial economy [7, 8].

The problems of the modern theory of finance, as well as theories in other sectors of the economy, are caused by the duality of goals:

- 1) determine the optimal choice of the individual;
- 2) describe the process of his real choice.

The classical theory of finance fully copes with the first goal, but is absolutely helpless in achieving the second. Similar problems in financial science suggest that the new paradigm will combine elements of neoclassical theory and features of the theory of supply chain finance.

Proponents of the theory of supply chain finance argue that psychology penetrates all three components of the traditional paradigm: rational behavior, the CAPM model and an effective market [9].

An alternative to quantitative theories of pricing for financial assets and portfolio optimization methods are the

so-called “supply chain finance” - a relatively young area that criticizes the results of quantitative methods. The subject of supply chain finance is the study of the impact of human presence on financial markets. There is no person in the standard finance course.

Supply chain finance is the doctrine of how psychology affects decision making in households, financial markets, and organizations. This does not imply that participants in financial relations will be rational and markets will not be friction. Researchers believe the institutional environment is vital. The starting point for them is to limit the rationality of all elements of the financial structure.

Supply chain finance studies the causes and effects of financial market inefficiencies: where do market inefficiencies occur and why do they exist; why ordinary investors tend to make mistakes; why arbitrageurs do not correct market inefficiencies.

The financial market is effective if and only if the price of each security equals the expectation of the present value of future income for that security (i.e. its fundamental value). In 1978, Jensen called the efficiency of financial markets the most empirically proven fact.

Significant empirical research in the field of cognitive psychology and the science of higher nervous activity of a person allows us to state that the real decision-making process cannot be explained only on the basis of the premise of rationality. The need for an adequate reality of explanation of decision-making processes and financial forecasting, in assessing the assets and trends of financial markets has led to the emergence of a new direction - supply chain finance, which is at the stage of formation of a scientific paradigm. Supply chain finance arose at the intersection of several sciences: experimental economics, cognitive psychology, decision theory, the science of higher nervous activity.

Supply chain finance is a research area in “irrational finance”, which examines the synthesis of classical theories and new concepts of analysis, modeling and forecasting the dynamics of the capital market, taking into account the unpredictable manifestations of irrationality in the stock market [2]. Supply chain finance is based on the premise that investors make decisions in accordance with the principles of supply chain finance theory and limited rationality; they expand the principles of implementing financial relations in the process of distribution and use of financial resources. Subjects are initially considered to be not completely rational in making decisions due to the fact that they may initially be mistaken in their ideas. In the financial field, subjects make decisions and act under the influence of prevailing prejudices, stereotypes, management and errors in the analysis of information.

References to the supply chain finance aspects of researchers of various financial problems are usually limited to one or two works of foreign financiers translated into Russian. Research centers, having fulfilled the plan to create scientific departments of the university, have not yet studied a single practically significant problem and have not developed a single supply chain finance concept for its development. In dissertations, supply chain finance theories are considered primarily as a tribute to fashion and a sign of the dissertation’s awareness of the latest achievements of financial science.

Supply chain finance tools are not used, the implementation of supply chain finance techniques is not carried out. In diplomas and master's theses, supply chain finance slogans sound like a challenge to the older generation. Often, supervisors do not represent the connection between the subject of final qualification work and the theory of supply chain finance, which gapes with a new patch on the ramshackle robe.

Foreign experience shows a similar picture. It is noteworthy that at a scientific conference devoted to the problems of supply chain finance and supply chain finance economics, in a behind-the-scenes conversation with leading foreign scientists, Russian colleagues asked to recommend some professor to give lectures on supply chain finance in Moscow, they asked: what is it, supply chain finance? This may seem like a living joke, but it is true that thirty years after the advent of the new sub-sector of financial science, leading psychologists, financiers, at a scientific conference on supply chain finance aspects, could not understand the subject matter.

To a researcher immersed from within in the processes of the formation of a Western scientific worldview, a student studying abroad, this does not seem strange. At lectures on economic mathematics, and on corporate finance, and accounting, students hear from teachers that traditional models and methods for solving modern financial problems traditionally do not work.

So, in the main financial disciplines, the problem of slipping the action of the traditional methodological apparatus of these disciplines when solving modern problems is developed - inadequate from the point of view of the traditional theory of the reaction of an economic entity to modern problems. In fact, he ceases to be an economic person - the reference model of all economic models since the time of Adam Smith.

It is the science of “supply chain finance” that examines the entire layer of these problems, distributed across different disciplines, holistically and conceptually. It is supply chain finance as a science that has replaced traditional finance that develops a comprehensive and objective methodological apparatus for studying these problems. And right now, the moment has come when the accumulated mass of problems unsolved with the help of traditional financial, economic, mathematical tools makes its existence obvious and necessary.

The key psychological concepts of supply chain finance in accordance with the concept are perspective theory, framing, and cognitive dissonance. This is justified by their primacy in the manifestation of the remaining elements of supply chain finance tools (heuristics), significant differences among themselves, the depth of research and development.

Supply chain finance [10-14] began to be developed in Russia relatively recently - at the beginning of the 21st century. Having caught the connection of this new scientific field with psychology, many scientists turned to research in this area. With the popularization of the work of D. Kahneman “Think slowly, decide quickly”, the fertile ground for the development of new science was generously spiced up with good advertising budgets of publishing houses [15].

At almost every scientific conference on economic problems, speakers address the issue of the impact of

supply chain finance aspects on valuation [16]. In leading financial universities, scientific centers of supply chain finance are organized. Thesis appeared on the topic of supply chain finance in various branches of financial science. Supply chain finance is already explored in graduate student work.

Analysis of achievements in all these areas shows the following. References to the supply chain finance aspects of researchers of various financial problems are usually limited to one or two works of foreign financiers translated into Russian. Research centers, having fulfilled the plan to create scientific departments of the university, have not yet studied a single practically significant problem and have not developed a single supply chain finance concept for its development. Supply chain finance theories in new dissertations are considered, first of all, as a fashion statement and a sign of the dissertation's awareness of the latest achievements of financial science. Supply chain finance tools, the implementation of supply chain finance techniques is not carried out. In diplomas and master's theses, supply chain finance slogans sound like a challenge to the older generation [17].

2. Materials and Methods

Supply chain sustainability refers to the management of social, economic, and environmental impacts, and the encouragement of good governance practices through the entire lifecycle of goods and services. For financial services, expanding efforts to include their supply chain gives companies a way to further integrate sustainability into their business, minimizing risks and enhancing opportunities that can be derived from supplier relations. While many FS companies do not face traditional supply chain risks, such as sourcing from factories in developing countries. The development of a toolkit for supply chain finance is carried out according to the antithesis of the stated attitudes of classical finance on the following points: investor errors are systematic and predictable; in spite of this predictability, due to restrictions on arbitration, arbitrageurs cannot take advantage of them and restore market efficiency. This can be called a brief quintessence of the first section of the concept, replete with numerous formulas, huge statistical arrays and contradictions and conflicts [18].

Supply chain finance research in the Russian financial market has revealed an important condition for the use of the supply chain finance apparatus: before using complex supply chain finance models to analyze the behavior of objects of supply chain finance research inadequate from the point of view of rational choice, you should first of all understand whether we are really dealing with irrationality or we are talking about ordinary financial illiteracy [19, 20].

Many empirical studies have revealed various phenomena of irrational behavior, as a result of which investors choose an alternative with less utility. The following phenomena are widely known:

- the effect of competence - the tendency to take more risks in areas where the individual considers himself competent and, accordingly, self-confident;
- the effect of over activity - the tendency to be more active and take on greater risk, which ultimately leads to a

relative decrease in profitability compared to moderate participants in financial activities;

- the effect of insufficient diversification - the tendency to choose a smaller number of financial assets and, accordingly, a higher risk compared to a moderate investor;
- the effect of "overreaction" - the tendency to overreact to new positive and negative information;
- the effect of conservatism - the tendency to lower the significance of new information, the inertia of assessing prospects;
- "trap" effect - refusal to stop further actions in the conditions of significant deterioration of investment indicators, depending on the significance of invested funds, energy and time in the implementation of the project;
- the effect of certainty is the preference for a more probable, but smaller income over a larger one, which minimizes possible profitability;
- the effect of the information cascade - preference in a situation of growing uncertainty of a third-party conformist opinion, regardless of the reliability and competence of the source;
- the effect of underestimating inflation - a choice based on absolute values of cash flows excluding inflation;
- the effect of time preferences - the tendency to take profits in the short term and to keep unprofitable assets for a long time;
- reflection effect - risk aversion when choosing a profitable perspective and risk appetite when choosing a loss-making prospect.

Classical models of financial theory are based on the provision on rational behavior, supply chain finance integrates rational and irrational behavior. As a result of studying the influence of the irrationality factor on the result of the choice of diverse alternatives, new models have emerged that have greater predictive accuracy and breadth of coverage of financial and economic phenomena [18].

There are two approaches to the study of supply chain finance. The first sets the starting point for the results of psychology that characterize human behavior in specific economic circumstances. These results are used to build new economic models and adjust existing ones. In another approach, economists analyze empirical deviations from traditional models. After that, the psychological aspects of human behavior are studied in order to find explanations for the revealed deviations.

The assumptions of supply chain finance are:

- the behavior of the subject of financial and economic activity is a combination of rational and irrational decisions;
- the form and structure of information affects the financial decision;
- the irrational behavior of the subjects affects the financial management process and the pricing of financial resources.

In the 1970-1980s, developed the so-called "Theory of Perspectives". They showed (in the framework of cognitive psychology) that the individual expectations of investors are due to a set of psychological factors [3]. Particularly popular with this concept was the book by H.

Shefrin, "Beyond Greed and Fear: Understanding Supply chain finance Finances and the Psychology of Investing" [4].

The forms of limitation of rationality, or the effects of supply chain finance, can be called the following:

1. Heuristics - solving a complex problem comes down to a simpler one. For example, investors act according to predefined rules that have been formed over time. At the same time, it is important to understand that the rules work in the source variables, when the input variables change, the behavior, and therefore the solution, must change. Changing variables leads to irrational investment decisions.

2. Excessive self-confidence and the illusion of managing a situation - the first pattern is related to the fact that investors overestimate their knowledge. The second trend follows from the first: market participants are convinced that they are in control of the situation, although in reality this is not so. This is sometimes called the disposition effect, i.e. reluctance of investors to admit their mistakes.

3. The effect of rejection of losses (described in the "Theory of Perspective") - subjects are not prone to losses, so they are more sensitive to possible losses than to the possibility of obtaining benefits. Economic entities react to situations that are identical in terms of the ratio of benefits to losses in different ways, depending on whether they lose or gain. This phenomenon by [5] is called an "asymmetric reaction" to changes in welfare, which means the following: economic actors are willing to take risks to avoid losses, but not in the case that may lead to profit.

4. Representativeness characterizes the tendency to look for trends in random phenomena, not owning real information, to judge something or make predictions about the future based on past experience of similar situations.

5. "Information cascades" ("The theory of herd behavior") - the effect characterizes the most common stereotype of behavior in the financial market. In this case, investors prefer to move in a stream rather than make independent decisions.

6. Supply chain finance framework - similar problems are solved equally, despite the fact that it is possible to choose other options when using a different solution algorithm. "The process of forming a framework" is an assessment of the degree of rationality in decision-making by examining whether an equivalent question will generate the same answer if asked in two formulations that are different in form but have equal meanings. Associated with it is the effect of market reactions to news. Similar news can be presented in different formats that affect the process of perception of information and are assessed by the investor as more negative or more positive.

7. Fixation (development of conditioned reflexes) is the adoption of a decision based on previous experience. Examples of fixation are past events or marked trends. When making a decision, subjects attach importance to the initial information, record the initial judgment, and only then make adjustments to it.

8. Misconception regarding awareness - subjects give preference to an already familiar phenomenon, event, object. In terms of risk, this is a prejudice that changes a person's perception. When evaluating hazardous activities, subjects are more tolerant of risk if they were

previously familiar with a particular circumstance or activity. Subjects to previously encountered risks are more tolerant than new ones. This is due to the effect of "home" preferences, when investors prefer domestic markets to foreign ones not on a rational basis, but for security reasons, often to the detriment of profitability.

9. The importance of competence - changes in the level of knowledge affect the perception of risk: the more the subject perceives any activity as "difficult to understand", the more anxiety he experiences.

10. The inconsistency of information available on the market - participants in the financial market always do not own complete information. Moreover, investor qualifications may not be sufficient to interpret the existing one. This phenomenon was studied by [5].

11. Cognitive dissonance - analysts regularly predict company development scenarios, course dynamics, etc. However, reality often does not meet expectations. However, adherence to current forecasts underestimates important information. A different approach to the interpretation of information is associated with this, as well as different conclusions from the same source data. These and other effects are found in both developed and emerging markets.

3. Results and Discussion

The basis for decision-making is information, its completeness, and therefore uncertainty. All decisions are made in uncertainty. It is known that uncertainty is a broader concept than risk, primary, necessary, but not sufficient condition for it. Risk may result from uncertainty, or it may not. The founders of supply chain finance tend to believe that risk is not an objective, but always a subjective phenomenon. As a result, the risk of financial instruments cannot be fully represented using the beta coefficient or indicators of the volatility of the yield on securities using the Capital Asset Pricing Model (CAPM). The basis of the theory of valuation is the concept of the discount rate, which is a measure of risk and brings future cash flows to the present moment in time. A rate calculated on the basis of the CAPM model consists of two elements: a risk-free rate and a risk premium adjusted by a beta coefficient. The unrealistic forecasts using the model has led to the need to find new approaches. In particular, in 1998 the article "Investor sentiment model" [6] was published, in which supply chain finance aspects were included in the risk analysis. Further studies showed that using the level of the supply chain finance parameter (investor sentiment) allows us to accurately predict market returns (and the dynamics of prices for financial assets) for a period of 1 to 3 years. It is this fact that explains the deviation of the market price of an asset from its fair value [7].

An attempt to conduct a supply chain finance analysis of the discount rate was made when developing the "Emotional Capital Asset Pricing Model (ECAPM) based on empirical data from German and US markets [8]. The researchers showed that the investor not only mechanically performs transactions with financial instruments, but also emotionally reacts to transactions, feeling frustrated or satisfied. This led to the idea of including an additional premium in the discount rate,

which will take into account and balance the emotional component of market participants.

Investigation of investor behavior depending on the projected and retrospective dynamics of the company's sales growth led to the creation of a Supply chain finance Asset Pricing Model. The essence of the model is the introduction of the psychological concept of affect, that is, some idea of "bad" and "good", which appears in the investor's subconscious mind quickly and spontaneously [9]. Affect acts as a measure of investor sentiment, on which the dynamics of the real value of assets depends. Not all researchers agree with the dependence of profitability on the affect parameter, but the empirical patterns described have led to a review of the structure of the discount rate.

In addition to the objective risk, measured by the beta coefficient, it includes the subjective component [10].

In the applied aspect, supply chain finance can be considered as the basis of stock trading, portfolio investment, business valuation, and the formation of capital structure. On the basis of the "loss aversion" effect, in which investors negatively perceive the risk of losses from investing, the majority of supply chain finance models for portfolio optimization in the securities market are built. Traditional portfolio theory is built on the direct relationship between risk and return. Given the supply chain finance aspect, the presence of an asymmetry between the size of the return on investment and the level of risk is revealed. Taking into account the effect of loss aversion leads to a more conscious use of models and brings expectations closer to reality.

Practical psychology shows that subjects systematically deviate from the predicted by the classical theory of choice, since they are biased in their perception of real facts. The portfolio formed by the investor according to the theory of prospects will significantly differ from the portfolio of the traditional (rational) investor, which determines the set of tools in accordance with the theory of expected utility.

In general terms, the theory of prospects and the cumulative theory of prospects determine the following concepts in the system of individual risk preferences:

- 1) investors value assets according to gains and losses, and not on final profitability;
- 2) subjects are less disposed to losses than are attracted by profit due to the effect of loss aversion;
- 3) subjects are more disposed to risk in the field of losses and avoid risk in the field of gains;
- 4) subjects overestimate low probabilities and underestimate high [1].

Based on aspects of the theory of prospects, it is possible to create decision-making models that determine the structure of capital. In particular, the theory of market tracking revealed that for companies there is no optimal debt – capital ratio, they allow it to change. Such free float of the debt-to-capital ratio is connected with the desire of companies to take advantage of the incorrect assessment of the cost of capital that arose on the market. Tracking market dynamics and capitalizing on the current undervaluation or revaluation of capital determines the capital structure, which is the optimal strategy.

The theory of information cascades suggests that the capital structure may not be selected on the basis of

calculations of the optimal structure or be formed depending on the sources of financing available at different periods, but be copied from successful companies, which saves time. The theory of managers' investment autonomy establishes a connection between managers' decisions and the investors' expected perception of these decisions. Managers implement only those decisions that, in their opinion, will be positively received by investors, and therefore, will positively affect the market value of the business. Thus, the capital structure develops more under the influence of investors, whose managers are the guides of desires. The last group of theories considers the influence of the personal qualities of managers on the formation of the capital structure.

These theories show that overconfidence is an essential factor in determining the structure of capital, which was not previously taken into account by any traditional theory.

4. Conclusions

Supply chain finance is a procedure that is only beginning to take its place in classical finance, but already now this area of financial thought can adjust the management actions of SMEs. Correction of traditional models for the effects of supply chain finance will allow you to make better investment decisions and bring financial forecasts closer to reality. Supply chain finance can help banks grow their SME portfolios in a sustainable and risk-mitigated manner. The industry is rapidly evolving, with local and regional financial institutions realizing the inherent opportunities within their corporate portfolios. Market trade flows and the increased availability and proficiency of technology platforms has made supply chain finance portfolio growth more feasible. Domestic financial science does not lag behind foreign achievements in this area. Models and methods of supply chain finance originate from traditional finance. At the same time, they turn out to be more complex and selective, more numerous than traditional tools. This is due to the fact that the conditions for their use are associated with various psychological conditions of a person, an object of research, a person making financial decisions.

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