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Graduate School of Management
Master in Management Program

USE OF SIMULATION METHODS IN
A COMPANY'S SHORT-TERM
FINANCIAL PLANNING:
THE CASE OF SMEs

Master's Thesis by the 2nd year student

Concentration — management

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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Описание цели, задач и основных результатов	<p>Цель данного исследования — выявление взаимосвязи между использованием различных методов краткосрочного финансового планирования и финансовой результативностью российского малого и среднего бизнеса. Исследование направлено на выявление вклада различных методов финансового планирования в перспективы роста компании. Для достижения поставленной цели были изучены аспекты различных методов краткосрочного финансового планирования и их взаимосвязь с финансовой успешностью компаний, рядом финансовых и нефинансовых параметров, влияющих на уровень доходности вложений (Return on equity).</p> <p>Для достижения цели были сформулированы и выполнены следующие задачи:</p> <ul style="list-style-type: none">• раскрыть понятие и сущность краткосрочного финансового планирования в компании;• рассмотреть методики краткосрочного финансового планирования;• разработать регрессионную модель

	<p>для тестирования сформулированных гипотез;</p> <ul style="list-style-type: none"> • проанализировать эффективность использования методов имитационного моделирования; • определить сферу научного и практического применения полученных результатов. <p>В ходе исследования был получен следующий результат: существует позитивная взаимосвязь между типом метода краткосрочного финансового планирования компании и ее финансовой результативностью.</p>
Ключевые слова	<p>Финансовое планирование, методы планирования, имитационное моделирование, прогнозирование, бюджетирование</p>

ABSTRACT

Master Student's Name	Aleksandr A. Belov
Master Thesis Title	Use of simulation methods in a company's short-term financial planning: the case of SMEs
Faculty	Graduate School of Management
Main field of study	Management
Year	2018
Academic Advisor's Name	Olga R. Verkhovskaya
Description of the goal, tasks, and main results	<p>The goal of this study is to define relationship between the use of different approaches of short-term financial planning and financial performance of Russian small and medium sized companies. The study attempted to identify contribution of specific forms and methods of financial planning to a firm's growth perspectives. In order to achieve the goal were studied several aspects of different short-term financial planning methods and their relationship with a firm's financial performance expressed by several financial and non-financial factors which effect on a company's return on equity (ROE).</p> <p>On the basis of the research goal five objectives are defined:</p> <ul style="list-style-type: none"> • to analyze the concept and nature of short-term financial planning; • to provide an overview of methods of short-term financial planning; • to develop the regression model for testing the developed hypotheses; • to analyze the effectiveness of using simulation methods of financial planning; • to develop managerial implications of

	<p>the obtained results.</p> <p>The result of this study is following: there is a positive relationship between the type of short-term financial planning methods a company use and its financial performance, which is defined through return on equity (ROE).</p>
<p>Keywords</p>	<p>Financial planning, methods of planning, simulation methods, forecasting, budgeting</p>

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INTRODUCTION

Financial planning is a key element of companies' systems of planning. Good quality of financial planning is an essential of a company's success, because it provides an ability to solve so strong issues such: effective cash flow management, optimal cash flow structure, minimizing of transactional costs and effective management in general. Planning as a whole and financial planning as a key interest for a company provides benefits for managers and shareholders of a company. Firstly, the good financial plan makes future finance more transparent and clear to understand. Secondly, perfect financial plan generates some opportunity for a company to be seen as a reliable and stable company that is extremely important for a company counterparties such as owners, bankers, potential investors, society. Also, the well-established planning system is a positive signal to the market that an enterprise is properly managing and risks of investment are low. Thirdly, high quality of financial planning enables a company to provide more accomplish financial control in order to overcome a crisis and lower financial risks. After all, allocation of some budget activities becomes more profitable due to decrease in money violation and lower tax payments. The last, but not the least benefit of a well-established financial planning is an opportunity to run a business successfully, to mitigate risk and cash flow violations. Successful companies are tending to extricate the maximum of financial resources and to provide extremely effective operations.

The main goal of development of short-term financial planning process for companies is to achieve investment targets, meet budget and reach projected financial results in the long run (for a long-term financial planning) and short-term period (for a planning within one fiscal year). Well established financial planning helps to control cash flows and to avoid a problem known as "gap of liquidity", where a company has positive effect of operations, but operations need more financial resources than a company has.

Scientific society started learning principles and mechanics of financial planning since the emergence of exchanges and broker's boards, but despite of deep scientific studies this topic, in our fast-paced world, companies face those old requirements of a good financial planning don't work in present conditions. Rules and requirements of successive financial planning become more tight and specific. Socio-economic relations in modern Russian society require being more qualified, more developed. In my opinion, such a development should be based on both theoretical and practical experience of international economic schools and businesses. Thus, in order to establish a good level of financial planning, we forced to analyze international

experience and well-known scientific studies and implement modern techniques of financial planning.

We've found a lot of researches are devoted to study the subject of financial planning, but only a small share of these researches dedicated to studying specifics of short-term financial planning. It seems very interesting, because exactly short-term financial planning is a key to successful implementation of a company's strategic goals. Surprisingly, but prevailing majority of researchers are conducted to study long-term planning instead of short-term. In the author's point of view, this situation occurs due to peculiarities of short-term financial planning, such as: short time period, big volatility, and instability of results, low level of predictability and limitations of planning based on historical dynamics.

In borders of modern conditions, it is extremely important to raise the quality of financial planning in order to optimize cash flows, make managerial decisions and predict financial results. There is a commonly known fact that traditional approaches to financial planning are not ready to work properly in a fast-paced business world, therefore, companies can make only a few decisions, because of a low probability of forecasts. What is a solution? The best solution is to use simulation methods to provide financial planning. These methods have as advantages as disadvantages, but their aim is to increase the quality of forecasts.

Use of modern methods in a company's short-term planning enables management to provide decision at a qualitatively much higher level. Simulation methods could be used for large-scale analysis and for analysis of many alternatives, therefore the quality of forecasts and managerial decision become well. Due to use of statistical methods, results of a simulation are much more detailed and show a greater accuracy of predictions. However, these methods are quite complicated to implement and require special knowledge and skills that often go beyond traditional requirements for accounting or planning.

Simulation methods (e.g. Monte Carlo simulation) have been studying since 1950. Thus, databases of international work papers conducted to simulation methods contain about 2000 of studies, whereas among Russian authors we've found about 25. The most interesting in our point of view are studies which represent practical effectiveness of simulation methods (Vershina, 2012; Goroshnikova, 2011; Zholudeva, 2011). This illustrates that modern methods of financial planning are not well-known in Russian scientific society. One of the aims of my Master Thesis is to cover this lack of knowledge.

One of the ways to address this **research gap** is to investigate the quality of short-term financial planning in everyday practices of Russian companies and built regression model in order to find out whether it is more beneficial for a company to use simulation methods of planning than traditional ones. Based on analysis and comparison of Russian companies' approaches to short-term financial planning, especially analysis of internal effectiveness, an accuracy of predictions and the level of cash gaps, and open discussion within the professional community, were developed research goal and research objectives.

Research problem and research question

The goal of the study "Use of simulation methods in a company's short-term financial planning: the case of SMEs" is to define relationship between the use of different approaches of short-term financial planning and financial performance of Russian small and medium sized companies. The study is attempted to identify contribution of specific forms and methods of financial planning to a firm's growth perspectives. In order to achieve the goal were studied several aspects of different short-term financial planning methods and their relationship with a firm's financial performance expressed by several financial factors which effect on a company's return on equity (ROE).

On the basis of the research goal five **objectives** are defined:

- 1) to analyze the concept and nature of short-term financial planning;
- 2) to provide an overview of methods of short-term financial planning;
- 3) to develop the regression model for testing the developed hypotheses;
- 4) to analyze the effectiveness of using simulation methods of financial planning;
- 5) to develop managerial implications of the obtained results.

Research question

In order to reach the objectives, the following research question was formulated:

- *What methods of short-term financial planning, fundamental methods or modern approaches provide conditions for better financial performance of Russian small and medium-sized companies?*

The research gap can be filled by answering research question through the conduction of qualitative research and applying multivariable linear regression model to the sample of Russian small and medium sized companies. The principal advantage of this type of research is that it is flexible and adaptable to change, without losing the direction of the enquiry (Matthews & Ross, 2010). A qualitative research is an empirical inquiry that analyses a current situation within its real-life context.

Novelty of this research is provided by the fact that in Russia a little attention is given to study and development of simulation methods. Our analysis showed that there were not conducted studies comparing the effectiveness of simulation methods and traditional methods of financial planning. Usefulness of this study is also supported by the fact that Russian companies are facing economic violence and the most interested in use of methods which could guarantee high effectiveness and accuracy of predictions. The double-digit growth of companies providing software for financial planning also promotes this definition.

Structure of the study

This research paper consists of 4 chapters, three main parts. The first chapter is devoted to the literature review of the concept of financial planning, its principles and forms, characteristics of short-term financial planning and review of methods of financial planning, as well as analysis of advantages and disadvantages of fundamental and modern methods of financial planning. Also, the first chapter covers the definition of SMEs (small and medium sized companies), its features and performance indicators and, finally, the decision of the author on the topic of study. The second chapter describes methods which are used in this research paper and the justification of used tools presented there. The main research tool is multivariable linear regression model complemented by in-depth interviews of experts in order to gain primary data. The third chapter contains formulation of research strategy, sample description, formulation of base and final models and regression analysis. The fourth chapter is dedicated to conclusions of the research paper, managerial implications and suggestions for future researches.

Chapter 1. FUNDAMENTALS OF FINANCIAL PLANNING IN SMES

Financial planning is a well-developed sphere of scientific study. It is quite extensively studied in Russian and foreign literature. Studies are both focused on theoretical and practical paths of implementing results of studies. The topic is well characterized, 50 years of scientific research allows suggesting that nowadays the understanding of the basic principles and areas of financial planning is at the high level, however, in the modern scientific community there are some disagreements concerning the content of financial planning. Also, there are some different views among Russian researchers and modern scientific society about the structure of financial planning and short-term financial planning and the scope of these terms.

1.1 The definition of “financial planning”

The definition “financial planning” is a bit more complicated as it seems at the first side. To understand and explain the concept of financial planning we should analyze not only general sense of the definition, but also, we should find out a whole picture of elements included in this term.

Reisdorfer (2004) investigated the topic of planning. According to the author, “planning” — is a process of management that consists of goals establishment, determination of targets, specification of actions to be done and development of the goal criterion. This process based on past and present information connected to the goal and includes elaboration of forecasts and analysis of results. According to Hoji (2000, p.359) “planning consists in establishing beforehand, actions which would be expected within the scenarios and conditions previously established, considering the resources which would be used, and attributing responsibilities to achieve the fixed objectives. These objectives would only be achieved with an appropriate and formally structured planning”.

Bishop (1983) in his study provides traditional meaning of “planning” definition. It has been suggested that planning in the company consists of 4 parts:

- Part I — Formulation of the plan. This part consists of analysis of resources of the company, forecasts and detailed description of activities to be done.
- Part II — Control of the performance. Mainly this part’s purpose is to develop indicators in order to measure performance according to plans prepared.

- Part III — Management of changes. This part of planning used to cover the need of reaction of changes. Plans bring some changes to the company and the company should have instruments to measure, manage and control changes.
- Part IV — Special aspects. In this part of planning process, the company deals with events and subjects that could affect the company.

A researcher (Larionova, 2008, 5) have studied a wide range of scientific publications of domestic (Russian) and foreign authors and concludes that the majority of studies devoted to problematics of financial planning as the main objective of study considered only financial resources flows, and only a few studies have indicated the need of determining financial relations and value ratios. On the basis of material and purpose-oriented approaches of financial planning, the author provides such an interpretation of the term “financial planning”: “Financial planning — is a relationship on the basis of the implementation of financial policy of an enterprise, budgeting income and expenses of a company and evaluating of the level of risks that occur during the process of financial planning”.

In the article “Financial analysis and planning: an overview” (Cheng F. Lee, 1983), the author states: “financial analysis and planning is one of the most important areas of business decision making”.

According to well-known Russian gurus of financial management, Gorfinkel V. and Shvandar A. (2007, 332), “financial planning – is a plan of actions and operations for reformation and effective use of financial resources, which provides a strong connection of revenues and expenses based on company performance indicators, and improves the efficiency of a company’s financial activities. The author of the study shares an idea that in Russian domestic scientific practice financial planning mostly interpreted as management process, but nevertheless, financial planning is also known as an effective management tool. The definition of financial planning from the side of view of a company’s management follows next interpretation: financial planning is continuous process of plans development, which reflects the main target of a company operations, growth and development. Financial plans are made in order to establish content and consistency of the process of financial planning and also to depict all the information delinked with a company’s financials and contains information on funding of a company and control of financial flows.

According to Uzun (2003) financial planning scope of decisions basically consists of four different cases:

- The level of investment in fixed assets.
- In the planning period, the company's liquidity or working capital requirement level.
- Debt and equity composition.
- How to evaluate business decisions.

In the study “Cash Flow at Risk: A Tool for Financial Planning” (Oral, 2015) the author states that: “Financial planning has three components including inputs, planning model and outputs. Entry of financial plans consists of current and future estimates of financial statements. Planning models; are tools to help profit, investing and financing calculations. The outcomes of financial plans are the tables of projected balance sheet, estimated income statement and forecast resource usage”.

Financial planning amounts to the process of developing financial plans and indicators in order to ensure the process of development of a company with necessary financial resources and improve the efficiency of a company’s financial activities and performance in the forthcoming period. The main distinguishing feature of financial planning is an ordering approach, according to which all targets should be achieved just in time and in the right way. In the study (Gitman, 1997) it is highlighted that financial plan is a declaration of activities that should be done according to forecasts. As a useful management tool, financial planning could be extremely helpful in situation of uncertainty. Financial plans are used for strengthening a company, achieving a company’s goals and for coordination of different departments, units and activities within the organization. In other study (Murphy, 2011) the author stated that financial planning is an instrument of control of performance.

In the study (Ross, 1995) the author affirmed that financial planning besides detailed identification of the company’s goals, should include guidelines, comparative analysis of the company current financial situation and target situation, plan of actions that the company should implement in case of unexpected events in future. The author states: “there are some basic financial policies, on which the company should decide on to form a financial planning, checking its growth and its profitability. Among them there are: opportunities of investments that one seeks to take advantage of; the degree of indebtedness that the company seeks to adopt; the amount of money that the company considers appropriate and necessary to pay to shareholders.”

1.2 Academic studies on financial planning and performance of SMEs

A great while researchers pay attention to financial planning. In the study (Robinson, Pearce, 1983) authors developed an idea that financial performance of companies is linked to company's planning practices regardless of size and industry of the company. They decided that formalized financial planning has a positive impact on financial performance in small companies. The key insight of this fundamental paper is that performance of the company is explained by the ability to take a quick action against fast pace of changes in business environment. This ability is achieved through formalized planning. Continuing this logic, (McKierman and Morris, 1994) developed this direction by testing interdependence of strategic planning and financial performance of SMEs in UK. Authors went beyond just confirming the dependency of planning and financial success of SMEs, they offered an idea that financial planning is a strong tool and a mechanism of control which allows an organization to achieve significant advantages in comparison to firms which are not formalizing planning.

Planning is not only a tool for control, is a tool for development and growth. Researchers (Fraser, Stupak, 2002) have studied the effect of planning and development of the company. Clear business goals, systematic review and control as well as project work provided with formalized planning principles allows following strategic targets and coming with positive financial results. In the study (Peel, Bridge, 1998) it was suggested that while the fast-paced changes, challenges and uncertainty are permanently attack SMEs, the value of financial planning is increasing as far as it helps to survive. Financial planning could increase strategic choices for SMEs, declared in the research of performance of SMEs in UK (Lyles, 1993).

The relationship between financial planning and performance has been widely investigated in the study (Peel, Bridge, 1998) of performance of UK's SMEs. Authors confirmed the hypothesis that effective capital budgeting (financial planning) methods has strong positive correlation to volume of sales, profitability and pace of growth of SME. Recent evidence on this topic tested on sample of 393 SMEs form different countries and industries supported previous studies and confirmed a positive effect of financial planning on success of the company (Osiyevsky, 2013). The research study by (Sandada, 2014) also found positive association between strategic planning practices and SME performance. This is consistent with the conclusions of (Hartman et al., 2015), which showed that planning principles and methods has significant differences in application to small and large sized companies, while the interconnection of financial planning methods and performance has been shown both by small and large companies.

Fast changing business environment forced SMEs to update their operations and reorganize behavior to be able to compete in a buyer's market. Through efficient operations, management systems and up-to-date financial practices SMEs build strong businesses in high competitive markets. The study on SMEs in Vietnam revealed that companies with established financial planning practices appeared to show better performance in terms of revenues and profits than those who ignore it (Masurel, Smit, 2000). Researchers indicated that success of a company in the market, whether it is a huge business or SME, is strongly correlated with the role of financial planning playing in the company. The same results are shown in the study by (Hilton, Maher & Selto, 2006). Authors tested the most serious issues that affect performance of SMEs, thus lack of financial resources and not effective financial management were two the most significant issues. While lack of financial resources limits growth potential, inefficient financial practices may damage both financials and operations of a company. On the contrary, efficient financial planning could be a trampoline that strengthens profitability and helps to overcome difficulties.

There is a consensus among economic scientists that financial planning is extremely important nowadays, when businesses are challenging high uncertainty, strong competition and limited sources of growth. Research finding by (Gibson and Cassar, 2012) also points towards effect of financial planning on performance which is explained by better decision making, performance and risk management - the most important factors that are strictly dependent to company's financial success. Now effective financial management as well as poor budgeting and low control leads to unpositive financial performance and eventual failure of business (Karadag, 2015). Data from US census Bureau (U.S. census Bureau, 2017) show that over 390 000 businesses failed in the United States in 2014 with the most frequent reason for failure – poor financial planning (U.S. Small Business administration, 2015). General problem of SMEs in United States is lack of formalized financial planning process (Karadag, 2015).

The above finding is consistent with the study by (Haltiwanger, Jarmin, & Miranda, 2013). Authors examined financial health of SMEs and come with conclusion that implication of modern financial planning methods for some small and medium sized companies can improve budgets, increase likelihood of potential increase of financial performance as well as decrease the probability of failure.

In 2009 Chartered Institute of Management Accountants (CIMA) conducted a study on 439 companies in different countries. The goal was to find out key financial planning methods used in these companies and examine whether there is a correlation between the financial

planning method and performance of the company. There were found nine key methods used for budgeting and financial planning. One of the key findings was that the smallest companies made the least use of operational budgets and preferred less sophisticated budgeting methods. However, after building proper regression model, researchers concluded that there is no significant difference in usage of financial planning methods: company size did not seem to affect the usage of the top three most popular financial planning methods. No less important was revealed correlation between the quality of financial planning and performance of the company regardless of the size, country or industry. Similarly, the study of Canadian SMEs (Armitage and Webb, 2013) also concluded that the more likely a company use proper financial planning method, the more probability of financial success.

The study of 100 South African SMEs, provided by Mutanda (2014) accepted the hypothesis that the most of SMEs don't understand the role of financial planning and pay low attention to financial management and control, what leads to inability to provide budgeting and manage company finances.

Although there have been conducted several studies on different samples of SMEs united by a common topic of financial planning and its effect on performance of the company. In 2013 there were investigated management practices and profitability of SMEs in Ethiopia. Authors (Lakew and Rao, 2013) studied financial planning practices and its effect on performance of small businesses and pointed out that the efficiency of financial management practices and characteristics can bring about higher profitability.

The study on the same topic based on a sample of Greece SMEs investigated how financial planning linked to financing. The author (Daskalakis, 2013) come to conclusion that small enterprizes that has effective financial planning in average showed better financial performance which lead to wider sources of financing and better covenants for debts. Thus, companies paying attention to financial planning has more wide access to sources of financing, and in long-term has wider options to grow.

Another one researcher looked precisely on financial planning and control, accounting methods and overall approach of financial management of small and medium companies in South Africa (Fatoki, 2012). He pointed out that low accuracy of financial planning as well as weak financial management of SMEs lead to limited growth perspectives and pore investment decisions. The same results were showw in the study (Ramswamy, 2012). The author identified

several negative effects of poor financial planning, such as limited sources of capital, huge cash gaps and low profitability.

In 2016 Okafor (2016) provided a study of the effect of financial planning practices on profitability and growth of SMEs. The study was focused on analysis of accounting practices, financial management and budgeting of SMEs. Results revealed that weak financial planning was correlated with low attractiveness to banks and fund providers, who questioned the performance and risks. Hence the study advised SMEs to use advanced financial planning approaches and increase the role of budgeting.

In a different study author attempted to understand the interconnection between financial planning and performance of SMEs and inversely (Agyei-Mensah, 2015). The author pointed out that weak financial planning forced SMEs to problems with performance. Budgeting decisions made in small firms influence their profitability. While weak performance leads to pressure from banks, shareholders and other counterparties, qualified financial performance tended to improve overall performance of a company.

According to investigation (Azhar et. al., 2010) of financial management practices of SMEs in Malaysia, three key components of financial management: planning, control and capital management were the most effective factors to provide long-term sustainable growth. The author came to conclusion that SMEs leading with this three components are in general show better financial performance.

In other study author explored the effect of financial planning provided by SMEs on a scale of financial performance (Rahamon, Adejare, 2014). Authors found that effective financial planning has positive relationship to financial performance, because better accuracy of planning increases the chances of business growth, better control and financial management.

In 2014 there was conducted a study on planning practices of SMEs (Amoah, 2014). Key findings of this study are SMEs that are not keeping financial planning are failing to complete financial reports in general has issues with performance. While other SMEs tending to build solid financial planning, principles showed required level of profitability regarding the Governmental program of supporting growth of business.

The topic of financial planning and performance is well studied and is developing last decades. The author reflected several indicative studies reflecting the importance of this topic. Dozens of researchers around the globe continue to study the correlation between financial

planning and performance of companies, one by one they confirm the existence of this correlation. Thus, author think rational to investigate the dependency between financial planning and performance of SMEs based of sample of Russian SMEs. The lack of studies covering this topic in Russia acknowledges theoretical contribution of this Master Thesis.

1.3 Core elements of financial planning of SMEs

In terms of widely accepted definition of financial planning, worldwide well-known financial experts provide more specific and more practice-oriented definitions of the term. In recent years, several studies have focused on value management. More recent studies have confirmed that a company's profitability is a sum of profitable activities. Such an approach leads to mushroom growth of an idea that management of a company should strive to provide only money generating activities. Therefore, nowadays business practices oriented on effective financial planning in order to increase profitability, effectiveness of operations and to find further growth drivers. Dong-Hyeon Kim, Shu-Chin Lin and Ting-Cih Chen (2016) undermine the intensively debated position that quality of in-company financial planning affects not only a company's success, but also generates real effects for the local economy. Financial development contributes to economic growth and intensification of business activities.

1.2.1 Essential components of financial planning

According to (GE Capital, 2012) financial planning in general consists of 4 key elements, each of them is a further step to achieve the company's goal:

1. Establishment of plans. The process of financial planning begins from a top level of the company's management. Top-management of the company launches process of planning by setting strategic goals. Goals could be numeric such as profit, return on investment or market share and abstract, such as leadership at the market or product launch. At this step the company provides preliminary analysis of its strengths in order to be correct in setting numeric targets. When the company clearly formulated strategic goals, it specified more tiny goals in order to achieve strategic ones. For large companies it is a common practice of setting hierarchy of goals which includes goals for the company, business units, departments, products, teams and even for every worker. This helps the company

to reach the target and motivates all the staff to be involved in goal achieving process and to recognize their contribution to the company's results.

2. Internal performance metrics. At this step managers start creating financial plan by using its goals to set numerical targets. Analysis of goals helps to estimate possible results of achieving goals and expected costs for goals implementation. At this step financial planners try to synch expenses and goals by providing deep detalization of operations and expenses which will occur during the process of goals achieving. Moreover, management prepares a complete set of measures, indicators and turnovers which are used for analysis of performance at any level of the company. It is extremely important for a high-quality financial plan to measure every effect of every action. During the planning period management could analyze performance indicators and find out which activities generate profits and which costs drivers are.
3. External factors. The process of financial planning includes forecasts. While internal factors are most likely to predict, thus, it is easy to control such factors and adjust them, some external events are unlikely and hard to forecast, which is to say that the company cannot control such factors. Despite such factors are unlikely, the company's management cannot ignore these factors, because they may affect significantly the company's business. That's why companies should plan how to use internal resources in case of surprising events. Other external issue delinked with the company competitors. The company should perform competitive analysis to understand ways of implementing strategic goals and also to be ready for the competitor's response. Also, management could benchmark from partners or competitors to impulse its own operations and increase business efficiency. Finally, companies could analyze external business environment in order to predict consumers, competitors and partners behavior and prepare the company for future shifts.
4. Financial planning and budgeting. When a company has a clear vision of its goals, targets and numbers to be achieved, completed set of forecasts and deep analysis of internal and external factors, it is time to create budgets. Budgets include all financial targets, forecasts of possible revenues and costs, evaluation of financing requirements. Budgeting is a process of preparing financial budgets at different levels of the company. Budgets of product lines, departments and business units are integrated in a consolidated annual financial plan.

Recognized experts in the field of corporate finance, R. Brealey, S. Myers and F. Allen (2011) argue that financial planning, besides development of plans and providing actions for effective use of financial resources, includes consideration of investment opportunities in order to raising funds for a company's growth and development. They state that financial planning strongly delinked with scenario forecasting. Scenario forecasts are models of possible future consequences of decisions taken. It also includes cash flows forecasting and reliability check, assessment of the actual company's operations and evaluation of reliability of planned financial results. In the book "Principles of Corporate Finance", they stated that: "It's been said that a camel looks like a horse designed by a committee. If a firm made every decision piecemeal, it would end up with a financial camel. That is why smart financial managers need to plan for the long term and to consider the financial actions that will be needed to support the company's long-term growth". A coherent financial plan needs a clear vision of an industry, of company and its position within the industry. If managers put together their clear vision and smart financial plan, they would ensure high speed of growth of the company. Authors noted that "short-term planning is, therefore, often termed cash budgeting". Financial planning in general consists of many times repeated processes of cash budgeting or short-term financial planning. Also, there is an interesting point, which authors proposed, financial planning could be provided as for a whole company, as for a certain project.

In addition, an expert in finance and econometrics, C. F. Lee (2009) offers a broader view of the structure of financial planning. The author states that financial planning is a continuous process of analysis of alternative investments, fund raising and dividend policies in the context of economic environment, which the company belongs to. Planning, according to the author's view, based on forecasting of possible outcomes of financial strategies and risks specific to each of the strategies. In a general meaning, financial planning is a process of development of different economic scenarios and elaboration of reaction strategies, as well as development of investment opportunities, fund raising and dividend distribution.

1.2.2 Advantages of financial planning

In R. Brealey, S. Myers and F. Allen (2011) view, the majority of companies spend tons of time, human, intellectual and financial resources for a high-quality financial planning in order to get three main advantages from this investment. These advantages are:

1. Contingency planning. High-quality financial planning goes beyond the borders of a simple forecasting. While forecasts based on a most likely outcome, but for

the most developed plans managers (or planners) should include some improbable events, besides those which are most easy to predict. If the most likely events it is easy to predict, managers could be ready to control these events and to overcome possible negative impacts. While unlikely events have a tiny chance to occur, negative effects of these events could be a really destructive force. Therefore, if planners think ahead possible future events, they have an opportunity to react faster, to protect a company from negative impact or to mitigate risks by responding to danger signals. Troubles become less risky, because high-quality financial plan includes not only analysis of possible outcomes, but also plans of actions oriented on easing of the situation. Successful companies develop a huge variety of plans asking on the question: “what-if?” They forecast different scenarios and prepare detailed plans of activities in case. For example, these scenarios should answer the question: what a company should do in case of high interest rates, low share prices, world trade slowdown, increase in lease payments or weak domestic currency? General idea is to elaborate a plan of responses to unavoidable event.

2. Considering options. Managers who develop financial plans should be focused not only on the process of planning, but also on opportunity seeking. During the process of planning in general or financial planning in particular, when managers forecast different scenarios of future outcomes, they provide detailed plans of actions targeted on overcoming unexpected issues. Sometimes these actions could represent a level of strategic decisions. It is seems obviously that a company’s management provide decisions based on a strengths of this company, even if scenario forces to exit existing business and enter new market. Thus, management of the company has a real option, an opportunity to make an investment that could seems unprofitable for a present moment, but could be beneficial in future if some of unlikely events surprisingly occur. Preliminary activities focused on overcoming negative future events could be an option to enter new market or new sphere of activities in future. When negative event will weaken the company’s competitors, the company will have opportunities for growth and expansion. All in all, huge investments oriented on protection of the company from negative events could be future growth drivers.
3. Forcing consistency. A good financial plan is an effective management tool, because “financial plans draw out the connections between the firm’s plans for

growth and the financing requirements” (R. Brealey, S. Myers and F. Allen, 2011). For example, if a forecast needs a growth speed at the level of 25%, a company will face the need of external financing, while for achieving only 5% growth a company could use its own retained earnings. High-quality financial plans ensure consistency of the company’s goals, while different targets have no mutual contradictions. In other words, well-structured financial plan includes as main company’s goals, as targets of departments / divisions / business units and maintains strong connection among them in order to cover all the tasks without and avoid conflicts of interests. Also, financial plans help to provide well defined profitability indicators that are clear for all departments of the company and will motivate departments to follow the company’s targets, instead of their own goals.

The most recent researches show that modern fast pacing world challenges the company and the only way to exist is to build an effective financial planning system at the company and to understand such challenges and be prepared to overcome them. According to PricewaterhouseCoopers research (PwC, 2011), there are 8 modern trends and challenges the businesses face:

1. Time-consuming, inflexible processes
2. Seeking the right level of detail
3. A tendency toward conservatism
4. Boosting forecast accuracy
5. A blend of top-down and bottom-up approaches
6. More frequent forecasting
7. Technology, process, and organizational improvements
8. Cross-functional collaboration

In the study “How planning and capital budgeting improve SME performance” (Peel, 1998) the author examines the effectiveness of financial planning as a strategic management tool. The survey conducted to more than 1000 enterprises and specified to evaluate how high-quality financial planning affects business performance and position of the company at the market. In this study was used five-point ordinal planning detail scale in order to effects of financial planning. The results of the study suggest that:

- From a wide range of objectives, for enterprises the most important ones are increase in profits, higher profit margins and sales growth. The majority of plans that companies prepare focused on achieving these three targets.
- There is a strong positive correlation between the quality of financial planning and business profitability. Also, the study showed positive association between intensity of financial planning and attractiveness of the company for investors.
- Quality of financial planning positively associated with the quality of investment appraisals within the company's operations. Companies which provide high-quality financial planning showed more accurate estimations of investment projects results, while those who prepare non-detailed plans closed its investment projects with lower turnovers and less profits.
- There is a close relation between profitability of the business and success in reaching strategic goals and quality and intensity of financial planning processes.

There is a consensus among business scientists that well-detailed; high-quality financial plans make the company to reach higher output, higher revenues and to be more competitive (Bracker and Pearson, 1986). Real businesses, such as transnational companies, also emphasize the importance of financial planning. "Financial plans can be a critical tool for any company. They help link a company's daily operations to its mission and both its short- and long-term goals. At the same time, financial plans provide investors with a roadmap for how companies will grow and mature. Financial plans can be motivating, a mechanism for rallying employees to hit targets and benchmarks. They also can be sobering, revealing if a goal is not attainable or providing insight into what adjustments companies have to make cost-cutting, divestment, and so forth to reach specified targets" (General Electrics, 2012).

Summing up, we can conclude that different financial schools represent several different positions on the topic of financial planning, the essence of financial planning in general interpreted similarly when it comes to the main aspects. Let's note basic postulates of researches on the topic of financial planning:

1. Financial planning is a process of creation of financial plans and documents, control of financial plans implementation and evaluation of results of the planning.
2. Financial planning is a useful management tool, used for improving the company's performance, control of revenues and expenses and setting and reaching strategic targets.

3. Financial planning includes cash flow forecasting, development of the company economic scenarios, risks and consequences of decisions taken.

1.2.3 Directions of financial planning goals

The topic of financial planning is well-studied and has significant practical importance, but still there is no unequivocal answer the question what is financial planning and what is taken as a goal of planning. Modern scientists share the same beef on the general meaning of financial planning, but in details they could be controversial.

According to nowadays approach, goals of financial planning can be divided to two conditional directions:

- The first direction focused on cash flows planning. The main goal of this approach is to plan the company's financial activities. For example, in the study (Khan, 2005) the author treats the main purpose of financial planning as the process of the company's liquidity control and maintaining of the level of revenue in order to cover all operational costs, debts and financial obligations of creditors and shareholders. In other words, the purpose of the financial planning is to avoid gaps of liquidity and cover the company's need of financial resources.
- The second direction, on the contrary to the first, focuses on development of successful financial strategies. There is a common view, that the purpose of financial planning is maximization of the profit of the company. Studies bases on the side of view that profit maximization is the most effective target for the company, because this target includes not only effective operations and planning, but also quality of management and resources use. Moreover, profit maximization leads to increase in revenue or decrease in costs, therefore, the final value for the shareholders of the company will increase (Lee C., 2011).

In the study (Oganyan, 2014) the author examines different approaches of defining the essentials of financial planning. Based on the analysis of positions of the most respectful financial researchers, the author formulates following objectives of financial planning:

1. To formulate and detail upcoming planning problems and define the system of challenges for the company and possible reactions to these challenges, based on strengths of the company and analysis of external environment.

2. To justify strategic goals, targets and objectives which are planned to be implemented during the period of planning and design scenarios of desired future position of the company.
3. To plan the need of actions, resources and technologies for achieving strategic goals and creation of plans of activities required for achieving a goal.
4. To identify resource requirements, plan capacity and structure of operations of the company.
5. To create and implement financial plans and control its execution.

However, in our opinion, we should add two objectives of financial planning in order to avoid partial specification of tasks:

- To check the consistency of goals, plans, resources and expenses
- To ensure interaction among divisions of the company.

More recent studies (Conneely, 2010) have confirmed that the purpose of financial planning is: “the long-term protection and development of the organization’s ability to accomplish its mission. In many ways this is also the purpose of developing a strategic plan. The financial plan needs to complement the provision of adequate resources necessary to support the valued direction and strategies of the organization. It also needs to ensure compatibility with the strategic values and priorities through a clearly articulated process of accountability to those organizational constituencies with a stake in the organization’s mission and services”.

Numerous studies have attempted to explain advantages of high-quality financial planning. If we put together the purpose of financial planning, its objectives and requirements, we can conclude that financial planning is extremely useful for the company. Firstly, high-quality financial planning is a safety pillow for the company, because it helps to avoid erroneous actions in the future and be prepared to some surprising events in future, which can significantly affect the company. Secondly, financial plans are based on forecasts and consider a certain degree of risk. Finally, financial planning is important, because it’s used to identify the company’s strengths and weaknesses and external threats and opportunities and create plans based on such factors, and realize them properly.

1.4 Principles and forms of financial planning

According to the both directions of defining financial planning goals, there are different approaches to defining the basic principles of financial planning. From the first approach, where the main goal of financial planning stated as planning of cash flows, principles are:

- The principle of integration. Financial planning must be integrated into the general process of planning and should be created in accordance to the global goal, strategy and targets of the company.
- The principle of solvency. Financial planning within the company should be organized in order to ensure the company solvent at any time of the planning period.
- The principle of taking into account the importance of external factors. During the process of financial planning, management of the company should be on the same page with market, competitors and partners. Financial plans must consider market need and external environment.
- The principle of marginal profitability (Chabotar, 2006).

According to the second direction, that focuses on development of successful financial strategies, principles of high-quality financial planning seems more general, but nevertheless, useful to understand:

- The principle of systematic planning. Financial planning is a continuous process, which consists of the set of ongoing stages. High-quality financial planning must be organized as united system of plans of different departments / business units of the company.
- The principle of coordination. All plans that are created during the process of planning must be coordinated. All information, resource requirements and targets must be approved only if plans have no contradictions. Also, plans should be mutually exclusive and collectively exhaustive.
- The principle of continuity. Financial planning is a continuous process; it is a circle of ongoing plans. Well established financial planning is an opportunity for the company to have a plan for any period of time.
- The principle of accuracy. Financial planning should be detailed and consistent. All plans must be detailed in order to ensure that the company plans are correspond to the company's capabilities.

- The principle of money and time. “Golden banking rule”: good financial plan must ensure that at any time the company must have financial resources to maintain its operations.
- The principle of the balance of risks. Financial plans should pay attention to liquidity risks. Good financial plan must avoid unprofitable or low-profitable solutions.
- The principle of paying capacity. Good financial plans must balance revenues and expenses in order to keep the company able to pay to debt owners.
- The principle of marginal profitability. The company should choose the most profitable projects or the least expensive if profits are equal.

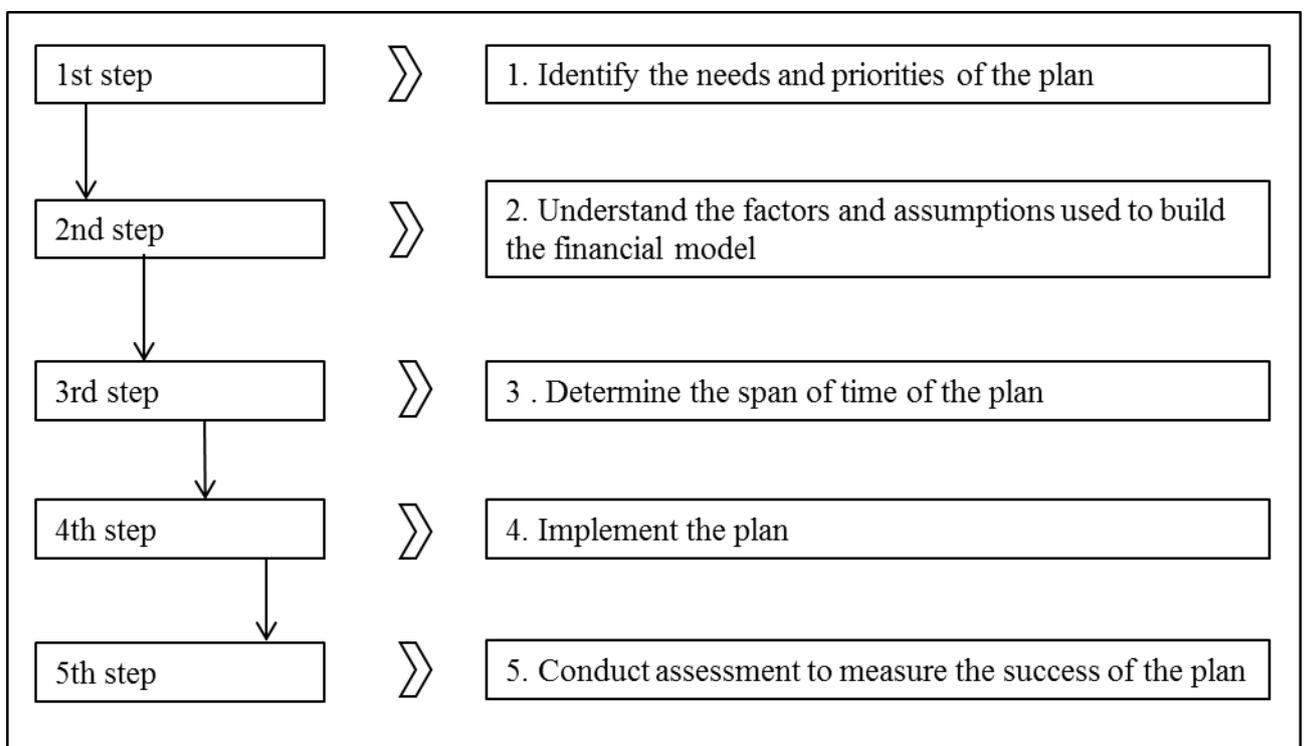


Illustration 1: 5 steps of the circle of financial planning.

Financial planning as ongoing process can be divided into several separate steps, within each of them the company provides planning. In study (Conneely, 2010) the author gave a comprehensive view of the circle of financial planning. In general, circle of financial planning consists of 5 steps (illustration 1).

The financial planning process is divided into five stages. It is suggesting that decisions taken at each of the stages of the process of planning affects the subsequent and future steps. Due to uncertainty and unpredictability of future issues and risks, companies have to maintain

continuous financial planning. Due to continuous planning process, companies have an ability to supplement the information needed at every stage and, if necessary, adjust solutions and accept new plans.

The cycle begins with the analysis of internal and external factors which may significantly affect the company and forecasting of future position of the company, demand for products and services, size of costs and revenues, etc. External factors affecting the company in general are the level of competition, inflation, currency risk, interest rates, pricing and production strategies of competitors, the level of technologies and the government policy. Then based on the identified factors and forecasts, the company creates pre-built solutions, evaluates the level of required investments, the level of production, marketing expenses, R & D costs, and dividend payments, and estimates the need for external financing.

After that the company evaluates forecasts and adjusts them in accordance with the company's position on the market, and projected position, creates additional plans. When plans are close to completion, top management of the company issues a system of specific performance measures and indicators in order to control implementation of plans. When plans are done and the company started to establish them, management of the company provide continuous analysis of performance and assessment of the quality of plans implementation.

During the period of financial planning, managers of the company analyze financial indicators, verify the quality of planning and control efficiency and, if needed, adjust plans and correct financial parameters. Finally, after a certain period, managers provide overall assessment, finalize the period results and make general adjustment to plans. After that the company starts the process from the beginning.

The system of financial planning consists of several forms of planning:

1. According to period of planning:
 - a. Long-term planning (planning period is more than one-two years)
 - b. Medium-term planning (planning period is one-two years)
 - c. Short-term planning (planning period is less than a year)
2. According to the company's goals:
 - a. Strategic planning (includes plans of development of the whole company in the longer term);

- b. Tactical planning (includes planning at the level of individual business units, or individual products, markets, and also planning of development of the company within one year)
 - c. Operative planning (includes planning at the level of individual plans, budgets, programs, and is responsible for the company's actions in the nearest time interval).
3. Prospective financial planning (includes forecast plans drawn up for three years or more, and determines key indicators, goals and objectives of the company, information regarding investing and financing activities of the company).

1.5 Characteristics of short-term financial planning

Market economy creates a tough competitive environment for the companies. The result of this confrontation is different barriers which limit the pace of a company's development. Firms face limited resources, limited growth perspectives and limited investment decisions due to unpredictable financial difficulties. It is necessary for the firm's survival to carefully plan each step. At the level of organizational development, a strategy is being formed, strategic lines are being drawn up, and strategic plans are being developed in such a way to ensure long-term existence on the market. Strategic plans contain the number of actions that enable the company to acquire and retain competitive advantages that will allow it to at least survive in a tough market environment and, at the maximum, become a leader, achieve its goals.

From this point of view, it is impossible to ignore the value and importance of short-term financial planning, because key tactical decisions of the company that focused on support of the course of the company and the direction of its' development are made on short time-frames. Thus, short-term financial planning creates as opportunities for the company to prevent mistakes, wrong decisions and weak financial solutions, as ensures optimal use of opportunities, as far as the choice is made through analysis and multi-stage selection process.

When developing the strategy, in particular, when it comes to immediate implementation of the strategy, goals become meaningful through the formulation of specific financial parameters and indicators. In the context of short-term financial planning, the use of financial indicators makes it possible to assess the viability of solutions, since the calculation of indicators or the degree of target values' achievement indicates the effect of competition.

Also, a number of studies reflect additional value of short-term financial planning due to the fact that through detailed elaboration of operational plans management can define optimal investment decisions; assess the quality of use of capital, improve the quality of reserve management, and reach a consensus with key stakeholders. Furthermore, as far as current plans are based on a specific, well-defined or predictable in short space of time information, it is easier to control decision making process. In this case solutions are less risky, especially in comparison to strategic planning.

In addition, during the process of financial planning is monitored a company's financial condition, financial operations and determined its creditworthiness. First of all, this is explained with aspiration to achieve a balance between the necessary costs and the real abilities of the firm. On the other hand, short-term financial planning is the link between various divisions (production, R & D, marketing, sales, etc.) which, in a certain sense, improves management and creates economic incentives for improving performance (Alekseeva, 2006). In other words, short-term financial planning affects all aspects of the company's activities.

The goal of short-term financial planning in the general sense is to solve difficulties, as well as to achieve the goals set in the strategic plan. Current or short-term planning includes the development of operational goals at the level of the company and at the level of particular divisions, the need of resources, plans for current activities, and plans of investments (Borodushko, 2012).

From the point of view that the short-term financial planning (the time interval from 1 to 5 years) is a set of activities defined by specific financial indicators, there is a following view of the objective of the current planning, which is defined as the achievement of certain financial normative values. Well-known guru of financial planning in his study (Lukasevich, 2009) proposes the following structure of target financial parameters:

- 1) The ratio of the level of debt to the amount of equity;
- 2) Coefficient of reinvestment;
- 3) Established levels of profitability;
- 4) Coefficients of instant and terminal liquidity;
- 5) Limit levels of financial risk in various areas of activity.

Western School provides somewhat changes to this list and expands it. Thus, the leaders of the German school (Khan and Hungenberg, 2005) believe that one of the key financial

indicators are indicators of investment activity (NPV, IRR, PI)¹, indicators of net and operating profit (NP, EBITDA)², as well as the capital cost index (WACC)³.

Short-term financial planning includes three types of budgets: operational, investment and financial (Troshine, 2009).

- 1) Operational budgets in the following areas:
 - a) Production;
 - b) Sales;
 - c) Materials, supplies and finished goods;
 - d) General expenses;
 - e) Commercial and administrative expenses (Shim, 2008);
 - f) Research and Development (Wagland, 2015).
- 2) Investment budgets:
 - a) Investment in real assets;
 - b) Investment in financial assets (Strieborny, 2015).
- 3) Financial budgets:
 - a) Cash flow budget;
 - b) Income and Expense budget;
 - c) Balance sheet (Barrett, 2014).

1.6 Methods of short-term financial planning

There are diverse types of Financial Planning models used by the companies, and they change as to the complexity level, that is within the activities and processes of the organizations. That is why, it is said that each company should have an appropriate model for its needs, because no company is similar to another one. The types of models generally change from the most generic, that possess single basic planning guidelines, up to the most sophisticated ones, that contains hundreds of equations and interdependent variables (Reisdorfer, 2013).

Existing system of methods of financial planning and short-term financial planning in particular, is conditionally divided into two areas: the fundamental methods and modern methods of financial planning. It should be noted that when it comes to fundamental methods, the Russian

¹ NPV – Net Present Value, IRR — Internal Rate of Return, PI — Profitability Index

² NP — Net Profit, EBITDA — Earnings before Interest, Taxes, Depreciation and Amortization.

³ WACC — Weighted Average Cost of Capital

scientific school shows a high level of immersion in the subject matter, and also reflects high degree of elaboration and high-quality learning materials. However, due to the small experience of applying methods, which are characteristic of a market economy, modern methods of financial planning are the property of a few. The level of development of these methods is relatively low, and only few scientists consider new methods as an alternative to fundamental methods.

If we look precisely on Russian business, we can conclude that modern methods of financial planning are used only by large, often international companies (mainly financial sector and industries with a large share of export operations). The use of modern methods among small and medium-sized companies is virtually non-existent, because business, in our opinion, lacks awareness of the significant advantages of modern methods.

Russian companies have relatively small business experience and, unfortunately, there is no "planning culture" among Russian companies. This leads to wrong managerial decisions, as well as to reducing level of the company's competitiveness (Yuzvovich, 2014).

The study of the importance of intelligent financial planning decisions (Blanchett, 2013) come up with conclusion that generally modern methods are difficult to use, require training that goes beyond the capabilities of the average accounting firm, and do not widely applicable because of the need to obtain special knowledge, as well as the need for special measures to introduce modern methods, limit their distribution. Nevertheless, the results of aFP's (association for Financial Professionals) 2016 Financial Planning Benchmarking Survey confirm the evidence that in the past three decades, things have changed. More organizations have adopted new ways of forecasting and budgeting that reflect the reality of a faster, more global and fiercely competitive business environment.

Previous studies have reported two categories of financial planning methods: historical data based methods and forecasted data based. Historical data methods generally focus on search of regularities and study of historical volatility of data in order to predict future numbers based on internal links within the data. On the contrary, methods based on forecasted data or, in other words, simulation methods, are provided through computer simulation of possible values of studying parameters according to build financial model (Overton, 2010).

Guru of financial planning and forecasting in his study of forecasting methods (Armstrong, 2011) highlights some of the most commonly used methods in financial panning of SMEs:

- Method of economic analysis;
- Regulatory method;
- Balance method (method of balance calculations);
- Multivariate (scenarios) method;
- Method of economic and mathematical modeling;
- Simulation methods.

1.5.1 Method of economic analysis

The essence of the method of economic analysis is the calculation of planned indicators based on an analysis of the actual values of financial indicators, as well as indices of volatility of these indicators in the forecasted period (Kim, 2011). In a practical environment, this method is used in conditions where technical and economic standards are not specified, there is no direct relationship between indicators. The method is based on expert assessments. The algorithm of the method is described in detail in Illustration 2.

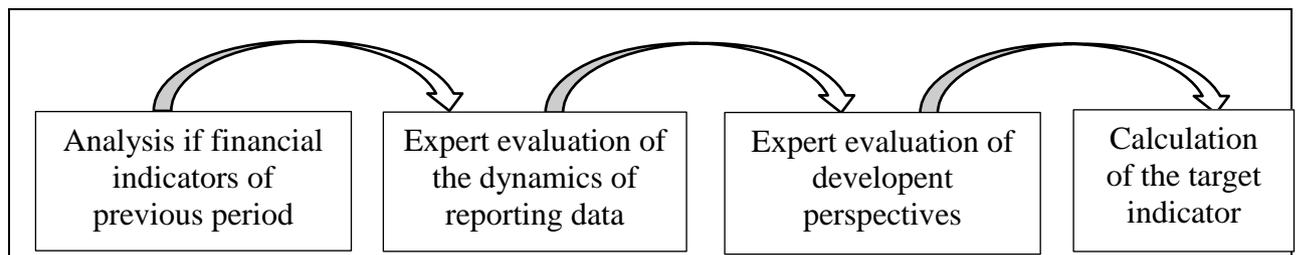


Illustration 2. Step-by-step algorithm of use of the method of economic analysis

This method is often used in planning the profit and loss statement, and determining the amount of necessary allocations to funds, reserves.

Calculation of the planned values of the main financial indicators is carried out in accordance with the formula: $V_{fc} = V_{rep} \times I$, where V_{fc} — is forecasted (planned) value of the financial indicator, V_{rep} — is value of the financial indicator of the previous reporting period, I — indicator of volatility of this indicator.

Economic analysis is based on the comparison of reporting and planning data with the purpose to analyze deviations and provide management measures to eliminate negative deviations. In addition, economic analysis provides an opportunity to understand the main trends and patterns and identify the internal reserves of the enterprise. For effective use of this method it is extremely important to have management accounting within a company, which, unlike

traditional accounting, allows obtaining operational information. Economic analysis involves the processing of a large number of primary data, for this reason, companies use modern software packages designed for a comprehensive assessment of the financial condition of the enterprise.

This method is fairly simple and intuitive. However, the problem area is the quality of expert judgments, as well as the company's performance (the planned figure is based on the actual result of the previous period, but we cannot be completely sure that this indicator will show the same degree of efficiency in this period).

1.5.2 Regulatory method

The essence of the normative method of financial planning is that the company's needs, in particular, the need for additional financing, are calculated on the basis of established norms and technical and economic standards. This method is based on the fact that planned, program and forecast documents of norms and standards are the basis for planning (McKinley, 2013).

Within financial planning, there is an extensive system of norms and normative indicators. Without loss of generality, six basic groups of standards can be distinguished in the system:

1. Federal regulation. This is the general standard of Russian Federation, which applicable for all industries, enterprises and forms of ownership. The main standards of this group are the rates of federal taxes, the rates of tariff contributions for state social insurance, and refinancing rates of commercial banks;
2. Regional standards or standards of subjects of the federation. Such regulations are in effect within certain regions of the Russian Federation. The main standards of this group are: rates of republican taxes, tariff contributions and fees, etc.;
3. Local regulations. Norms applied directly within the separate municipal entity or district. For example, special tariffs for single-industry towns and town-forming enterprises. The main standards of this group are: rates of local taxes, tariffs and fees;
4. Industry standards. Industry standards are applied on a scale of individual industries or groups of organizational and legal forms of enterprises. The main standards of this group are: the norms of marginal levels of profitability of

monopoly enterprises, marginal rates of allocations to the reserve fund, tax exemption rates;

5. Group standards. Special normative indicators used in the financial planning of groups of enterprises. The main standards of this group are: preferential tax rates established for small businesses, standards for allocations to the reserve fund, a fund for paying dividends on preferred shares;
6. Company standards. This group includes standards developed directly by the enterprise and used by it to regulate the production and trading process and financial activities, control over the use of financial resources, and other goals for effective investment of capital. The main standards of this group are: the requirements for working capital, accounts payable, stocks of raw materials, materials, goods, containers, standards for the allocation of financial resources and profits, the norms of reserve deductions.

This method can be characterized as simple and clarified. Planning is carried out based on the values of standards, as well as based on the value of the basic indicator. The result is planned financial indicator. However, this method is inconvenient because the standards are constantly changing and the company is forced to regularly adjust its budgets and internal regulations.

1.5.3 Balance method

The principle of the balance method of financial planning is that a company is focused on the need to balance available financial resources with the planned need for them in order to carry out their activities (Krylov, 2014).

Balancing is carried out by building balance equations, of the form: $F_{\text{beg}} = \text{Rev} + F_{\text{end}} - \text{Exp}$, where F_{beg} - is the available balance of financial resources at the beginning of the planned period, Rev - is the total amount of revenues during the planned period, Exp - is the total amount of expenditures during the planned period, F_{end} - is available balance of financial resources at the end of the planned period.

A company creates a balance sheet that shows the main directions and volumes of resource used, on the one hand, and the volume and sources of the receipt of the necessary resources, on the other. The balance method is used in business planning in the process of preparing the forecast balance, and in addition, the basis of the balance method is used in

compiling the plan of receipts and payments, the income and expenditure plan, the payment calendar.

It should be noted that the organization can achieve a complete balance using this method, balancing each of the sources of cash inflow and outflow. The method is applied repeatedly, and balance is reached by the compromise between various sources of profit and losses. In general, this method is labor-intensive, since it requires a lot of iterations to prepare the final balance, but this method is actively used in planning the allocation of funds, the method is traditionally used in the development of the financial budgets.

1.5.4 Multivariate (scenarios) method

The method of multivariate (scenarios) consists in choosing a control indicator, calculation of its probable value (which corresponds to the most probable scenario) and estimation of its deviations from the average value (i.e., the development of pessimistic and optimistic scenarios). As a control indicator can be used next parameters: weighted average cost of capital (WACC), net present value (NPV), return on equity (ROE), and return on assets (ROA). Based on deviation analysis is calculated sensitivity index, which determines the probability of particular value of the forecasted parameter (Baldacci, 2009).

Multivariate (scenarios) method can be represented by the following sequence of steps: analysis of existing information, preparation of several financial plans, calculation and selection of an optimal financial plan, according to the specified criteria. The following indicators can be chosen as criteria: minimization of various types of costs, maximization of profit, maximization of returns on invested capital, minimization of the turnover period, minimization of financial risks, optimization of debt-equity ratio, minimization of financial losses, etc.

For example, if the criterion of minimizing investment costs is chosen as an alternative criterion, the valid formula will look like: $Exp_{curr} + K_{eff} \cdot X \cdot I = \min$, where Exp_{curr} — is the company's current operating costs, K_{eff} — is the coefficient of investment efficiency, I — is volume of investment. This method is useful in its many variants, but the use of this method is limited by the high probability of deviation of real indicators from planned values.

1.5.5 Method of economic and mathematical modeling

The principle of the method of economic and mathematical modeling in short-term financial planning is that factors that determine the values of financial indicators and the corresponding financial indicators are linked in quantitative terms using economic and mathematical models. The model includes the representation of the economic model in mathematical form, the main factors, as well as the mathematical characteristics of the parameters of the change in the economic phenomenon characterized by the selected factors (Medio, 2010).

Typically, the model is based on a functional or correlation relationship. And the functional connection can be represented in the form: $Y = F(X_1, X_2, \dots, X_n)$, where Y is the planned financial indicator, X_i — are the factors influencing the value of the planned financial indicator.

The correlation relation is expressed with the help of regression equations of various types (single-factor, multifactorial, linear, parabolic, etc.). In general, multifactorial regression models have the form: $Y_i = \beta_0 + \beta_1 * X_1 + \dots + \beta_n * X_n + \xi_n$, where Y_i is the planned financial indicator, X_1, \dots, X_n — are factors influencing the value of the planned financial indicator, β_0, \dots, β_n — parameters (regression coefficients) estimated by statistical methods, ξ_n - random regression errors (Volodin, 2011).

The peculiarity of this method is that the model includes primarily the main factors, or enlarged indicators. The predicted quality of the model is determined by statistical methods, and is also confirmed by practice. Due to specific structure, complex models with multiple factors can sometimes not yield meaningful results. In addition, some patterns in short time intervals are simply not detected which affects the final result and can lead to ambiguous forecasts. Also we should mention that the main difficulty encountered in calculating the model is the study period. Too short a period does not show the desired patterns, and at the same time, economic patterns are impermanent, and for a long period they are distorted. Finally, the process of building a model is very time-consuming, it is hardly carried without using application packages.

1.5.6 Simulation methods

The method of simulation is based on writing a computer model that can solve complex problems and problems of companies through experimental analysis (Laenko, 2016).

This method is based on simulating of a large number of realizations of the process constructed by the researcher and studying the relative proportion of successful outcomes. This method is very effective due to the fact that implementations of simulated random processes have probability characteristics similar to those of the problem being solved. When solving the problem, thousands of iterations ("runs", repetitions of the simulation) are performed, which, according to the law of large numbers, allows a researcher to get a fairly accurate forecast. In practice, the method is performed by generating a set of random numbers having a certain probability distribution, depending on the type of data for analysis.

This method is characterized with the following features:

1. Increase of the number of iterations leads to increase of the accuracy;
2. The method shows sufficient high quality, because random errors do not significantly affect the final result;
3. The results are of a probabilistic nature (that is, the final result shows not only possible events, but also the likelihood of their occurrence);
4. Ability to conduct sensitivity analysis.

In comparison to imitation models, analytical methods show coarser results, take into account a smaller number of factors, are based on assumptions, and are also constructed in a more simplified form. On the other hand, the results of simulation cannot so clearly reflect the laws of the phenomenon. Simulation models, as a rule, are more detailed, show greater accuracy due to the use of statistical methods; however, while they are more cumbersome, they require at times greater efforts for calculation. Nevertheless, simulation models are useful because model adjustments can be done manually and make decisions until the model is formed.

The simulation model provides an opportunity to predict a particular event with high probability, for example, to determine whether the company has enough financial resources. The simulation model is a random process, modeled by multiple generations of random numbers and subsequently merging several random flows in accordance with the established algorithm. Simulation systems are the most effective tool used in studies of complex systems, such as the

financial planning process. This method is universal, regardless of the complexity of the simulated systems and the level of detail.

The use of simulation models in financial planning gives the company a wide range of advantages compared to experimenting with a real system and using other methods. The cost of modeling of management decisions is much less than the cost of a possible negative effect when making an unsuccessful decision.

Also, the simulation model allows you to build a system and evaluate its effectiveness almost instantly, for this there is no need to create a real object and expect a certain period of data to appear, it can be modeled. Simulation allows considering any unlimited number of variants of events, simulating any financial situation, which allows the researcher to improve the quality of forecasts and take into account all sorts of risks.

In addition, we should remember that traditional methods of financial planning are labor-intensive, require long calculations, while calculations themselves are full of abstractions and assumptions. The simulation model, on the contrary, describes the system in its natural form, which avoids the assumptions and inaccuracies in the translation of mathematical formulas. An important advantage of using the methods of simulation is the ability to visualize the model. Graphical interpretation empowers managers to clearly evaluate events, make a decision. Unlike other methods, simulation methods are universal. The model does not need to be rebuilt significantly to simulate certain processes of the company, only some corrections of the general model are enough.

1.5.7 Comparison of the features of methods of short-term financial planning

Due to the significant contribution of financial planning to the quality of decision making and, as a result, to the value created for shareholders, a lot of works have been devoted to the study of financial planning as a scientific discipline. In accordance to the development of the scientific base on this issue, the level of understanding of the deep links of this discipline is grown. Thus, the development of the theory led to a new understanding of financial planning, to a broader view of the problems of financial planning, including consideration of not only financial flows, but also emerging relationships, cost proportions.

At the present time, none of existing methods of financial planning and forecasting can provide absolutely correct result of planning. Only a combination of different planning methods, experience and flair of the company's managers will help to develop a reliable financial plan and achieve the company's prosperity in the long term (Laenko, 2016).

Methods of short-term financial planning can be combined to two groups:

- Fundamental methods (method of economic analysis; regulatory method; balance method (method of balance calculations); multivariate (scenarios) method);
- Modern methods (Method of economic and mathematical modeling; Simulation methods).

Groups are formed according to principles of financial planning provides with these methods, as well as common assumptions. Different methods characterized with specific advantages and disadvantages (Table 1) and peculiarities of use. Each of the fundamental methods assumes the stability of the change in financial parameters, and interrelation of financial indicators through their economic sense or a relationship due to the use of correction coefficients.

Also, if we were considering decision making or choosing of the best alternative, there was predetermined goal of a forecast. In general, this approach is worthwhile when it comes to predicting stable indicators or planning simple systems. However, when there comes to planning and forecasting in strong uncertainty conditions, when the external environment is fast changing, and internal systems have non-trivial interrelations, the company management is troubling to find a unified approach that guarantees high accuracy of the forecast, or provides at least a certain level of quality of the management decisions. In other words, in a complex business environment, which set non-traditional tasks, from a practical point of view, traditional methods of financial planning are ineffective (Snetkov, 2008).

Table 1 — Advantages and disadvantages of methods of short-term financial planning

Method	Advantages	Disadvantages
1. Method of economic analysis	<ol style="list-style-type: none"> 1. Method is fairly simple and intuitive; 2. Easy to replicate; 3. Easy to input changes. 	<ol style="list-style-type: none"> 1. Method based on expert assessments, which can be subjective; 2. Works only in managerial accounting; 3. Time-consuming method.
2. Regulatory method	<ol style="list-style-type: none"> 1. Method is based on use of strictly defined rules; 2. Easy to execute. 	<ol style="list-style-type: none"> 1. Method is inconvenient in changing environment; 2. Hard to adjust values within the model; 3. Doesn't count the effect of external factors.
3. Balance method (method of balance calculations)	<ol style="list-style-type: none"> 1. Easy to repeat; 2. Method provides an opportunity to adjust values without rewriting a model; 	<ol style="list-style-type: none"> 1. Time-consuming method; 2. Needs carefully defined coefficients; 3. Limited field of use.
4. Multivariate (scenarios) method	<ol style="list-style-type: none"> 1. Method provides several scenarios; 2. Method is based on use of several financial indicators. 	<ol style="list-style-type: none"> 1. Needs carefully defined coefficients; 2. High probability of deviation of real indicators from planned values 3. Operates under subjective assumptions.
5. Method of economic and mathematical modeling	<ol style="list-style-type: none"> 1. High quality of predictions due to use of statistical approach; 2. Complex approach, which take into account both external and internal factors. 	<ol style="list-style-type: none"> 1. Some short-term patterns are undetectable; 2. Time-consuming method; 3. Hard to choose right time interval of data, on which forecasts are based.
6. Simulation methods	<ol style="list-style-type: none"> 1. High quality of predictions; 2. Calculates probabilities of events; 3. Universal method able to solve complex tasks; 4. Low cost of modelling; 5. Easy to adjust parameters. 	<ol style="list-style-type: none"> 1. Time-consuming method; 2. Needs specific knowledge; 3. Depends on the quality of input parameters.

Source: Created by author

1.7 Research gap and formulation of hypotheses

We've found a lot of researches that are devoted to study the subject of financial planning, but only a small share of these researches dedicated to study specifics of short-term financial planning. It seems very interesting, because exactly short-term financial planning is a key to successful implementation of a company's strategic goals. Surprisingly, but prevailing majority of researches are conducted to study long-term planning instead of short-term. In our opinion, this situation occurs due to peculiarities of short-term financial planning, such as: short time period, big volatility and instability of results, low level of predictability and limitations of planning based on historical dynamics.

There is a commonly known fact that tradition approaches to financial planning are not ready to work properly in a fast-paced business world, therefore, companies can make only few decisions, because of a low probability of forecasts. What is a solution? The best solution is to use simulation methods to provide financial planning. These methods have as advantages as disadvantages, but their aim is to increase quality of forecasts.

Use of modern methods in a company's short-term planning enables management to provide decision at a qualitatively much higher level. Simulation methods could be used for large scale analysis and for analysis of many alternatives, therefore the quality of forecasts and managerial decision become well.

Simulation methods (e.g. Monte Carlo simulation) have been studying from 1950. Thus, databases of international work papers conducted to simulation methods contain about 2000 of studies, whereas among Russian authors we've found about 25. The most interesting in our point of view are studies which represent practical effectiveness of simulation methods (Vershina, 2012; Goroshnikova, 2011; Zholudeva, 2011). This illustrates, that modern methods of financial planning are not well-known in Russian scientific society.

One of the ways to address this research gap is to investigate the quality of short-term financial planning in everyday practices of Russian companies and built regression model in order to find out whether it is more beneficial for a company to use simulation methods of planning than traditional ones. Based on analysis and comparison of Russian companies' approaches to short-term financial planning, especially analysis of internal effectiveness, accuracy of predictions and the level of cash gaps, and open discussion within the professional community, were developed research goal and research objectives.

Based on literature review above, we can combine approaches of financial planning to two groups: traditional methods (fundamental) and modern methods (simulation). The first group consists of traditional budgeting methods which were developed in the previous century and were established in Russia in 1990s and doesn't change significantly. The second one represents the latest approach to predicting future cash flows or financial planning — simulation modeling. From a firm's point of view, not only the method of planning plays a role, but also the way how it implemented and used in the company.

Several parameters were looked at as the indicators of successful financial performance: those, characterizing company's financial results (return on assets (ROA), net profit margin, level of cash gap) along with additional financial and non-financial data about a company (company age, size of the company, growth rate) were analyzed. These parameters reflect nowadays approach for evaluation of effectiveness of financial planning and capital budgeting. Several studies (Batra, 2017; Lyngstadaas, 2016; Georgescu, 2010; Bennouna, 2010) have shown the importance of balancing the level of cash in order to avoid significant cash gaps. It was especially useful to analyze researches that were considering the following variables: size of accompany (Mabert, 2003), firm age (Forbes and Milliken, 1999), growth rate (Ouakouak, 2015), return on investment (Glaister, 2008), net profit margin (Huang, 2009).

It is important to look at the financial performance of companies using different methods of financial planning. Nevertheless, based on the literature review, it was suggested that companies that use modern approaches of short-term financial planning have more opportunities for successful financial performance. Therefore, based on analysis of Russian companies' planning system the 3 hypotheses were operationalized using both indicators – level of cash gap and return of investment (Table 3).

Table 3. Hypotheses of the study

Hypothesis 1	Use of simulation (modern) methods of short-term financial planning has a positive relation with company's financial performance.
Hypothesis 2	Companies that use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

1.8 Summary of Chapter 1

In today's fast-changing and dynamic business environment, going with a static budgeting and forecasting approach is simply not feasible and can lead to missed opportunities and inferior financial performance. That's why more companies are adopting more agile forecasting and budgeting methodologies that allow them to look beyond the fiscal year and adapt their business to changing market conditions.

The value of financial planning to the company cannot be overestimated, especially when we keep in mind unstable political and economic business environment. Nowadays companies face the absence of stable resources of funding, which is typical not only for emerging markets such as Russia, but also for developed countries. Companies need high quality of financial planning to mitigate risks and gain more profits. On the other hand, due to various risks and challenges of external environment, companies face increase in costs: transactions become more expensive, shareholders ask for higher returns, contractors may request increased collaterals and more receivables. Moreover, the company's investments cause more risks for the company, because investment projects performance strongly delinked from the future cash flows, which become more volatile.

These factors significantly affect the company. Thus, in order to overcome negative effects of these factors, the company should take actions. In this situation high quality of financial planning is an effective management tool, because it enables the company to make more accurate forecasts, evaluate outcomes of projects and make better managerial decisions. High-quality financial planning reduces the level of risks both as internal as external and makes the company able to use fewer resources and become more efficient.

Chapter 2. RESEARCH METHODOLOGY AND DESIGN

This chapter is dedicated to the introduction of main research questions and a detailed step-by-step description of the research methodology of this paper. Overview of the studies and literature in the previous chapter revealed a research gap between scientific view of financial planning and practical approach.

As previously stated, the major research questions of this study are the following:

- What methods of short-term financial planning, fundamental methods or modern approaches provide conditions for better financial performance of small and medium sized companies?

The nature of these research questions forced us to find optimal combination of methods for this study and focus on analysis both primary and secondary data as well as examine both quantitative and qualitative data. Limited availability of primary data forced us to use several methods such quantitative search, in-depth interviews and case study.

This chapter's role in the thesis is to provide detailed description of the process of collecting data, conducting a study and formulation of research process. This chapter also explains which methods were selected, how process of data analysis was built and the key findings. The structure of this chapter consists of: methodology, data collection and research sampling.

2.1 Research methodology

In a nutshell, methodology is about the way the research was made. Robert K. Yin (1994) states the role of methodology underlining that results that researcher get are mainly influenced by the choice of methodology. Also, he defines three conditions which will help a researcher to choose the most appropriate method among the variety of different methodological approaches:

- 1) First, researcher should define the type of research question
- 2) Second, investigator should evaluate the level of availability of data
- 3) Finally, researcher should be focused to use the newest data and contemporary events for the study as opposed to historical

In this study will be used quantitative type of data. In addition, the qualitative approach was used in this study. Several interviews were provided to collect relevant knowledge on how type of financial planning effects on company's performance. During these interviews the author revealed several financial and non-financial parameters that CEO's of observed companies' link with success of their companies. This knowledge will help to make conclusions regarding the results of empirical study as well as to come with a set of independent parameters for models. Generally, interview benefits the researcher, because allows him to investigate real life events, accumulate experience as well as measure the impact of concrete events and decisions and gather primary data and collect opinions of decision-making persons from several Russian companies across different industries. Through analysis of concrete situation researcher could understand the essentials of situation and evaluate the quality of decisions made and solutions (Patton, 1990; Bromley 1986; Yin, 1994).

Within the borders of this study will be analyzed several latest events of applying simulation methods of financial planning. As far as the researcher cannot control these events and even cannot manipulate the date and has no control over the company's decisions, case study approach seem the most reliable and appropriate for this research. One of the research questions leads us to examining current situation and firms which operates at current market conditions, thus use of case study approach will cover both these spheres. For the research were chosen 5 cases according to the needs of the study.

In order to maintain high quality of study, investigation should must comply to two principles. Firstly, information should be collected from different sources and should be relevant and appropriate for the study. Several sources of information lead to more deep understanding of the research questions and the final goal of the study. For this study the main focus was on the multiple sources: in-depth interview, direct observations, database search, and analysis of documents.

Based on this research questions, there was developed an approach of data collecting, developed interview and defined sample. In this study forefront of analysis is analysis of key aspects of financial planning, effectiveness and accuracy of planning in Russian companies.

Current study can be characterized as descripto-explanatory, because it follows two goals: to formulate the description of the observable phenomenon and to find out the relationship between methods of financial planning used in companies and financial results, accuracy and quality of the forecasts. However, this strategy sometimes leads to confronted results due to

potential inaccuracy of data, missing information and incorrect values (Saunders, Lewis and Thornhill, 2009). At the forefront of the study are located panel data. The longitude of the data guarantees more precise results, maintains lower collinearity among variables. Panel data allows the researcher to provide more depth analysis and study more issues than time-series or static data. Along with providing more opportunities for the researcher, to work properly with panel data it is needed to have specific skills, because panel data is known for complicated modelling and interpretation process (Park, 2011).

2.2 Data collection procedures

Normally, the data are gathered from a variety of sources, by using several different methods to gather data like, for example: observations, surveys, interviews. According to Corbin and Strauss, in any study, the researcher can use one or several of these sources alone or in combination, depending upon the problem to be investigated. (Corbin and Strauss, 2008). Other considerations can be the desire to obtain various types of data on the same problem, such as combining interview with the observations.

2.2.1 In-depth interviews

The main goal of this type of data collection is to get as much information as possible. This part includes in-depth analysis of the interview. Interviewers give a lot of additional information that can be obtained only from the primary source. This study consists of several methods which were used to analyze the topic deeply. It's necessary to show the process of primary data collection (Illustration 3).

The interview method of research, typically, involves a face-to-face meeting in which a researcher makes individual questions. During the interview it's very important to pay attention to the following aspects:

- Confidentiality
- Bias
- Accuracy

The author (Lofland, 2006) states that one of the central obligations that researchers have to respect is confidentiality, "assurance of confidentiality" is important, where the real names of persons, places and so forth will not be used in the research report.

Literature highlights 4 types of interviews (Corbin and Strauss, 2008):

- i) informal;
- ii) general;
- iii) open-ended;
- iv) fixed-response.

In this study The open-ended type of interview was chosen because it's flexible and provides uniformity. From our point of view, the first 2 types of interview can't be used because they don't correspond to the type of study, and the third type was rejected because answers can't be predefined. The main threat and disadvantage of the interview method is that it requires your communication skills to be on a high level.

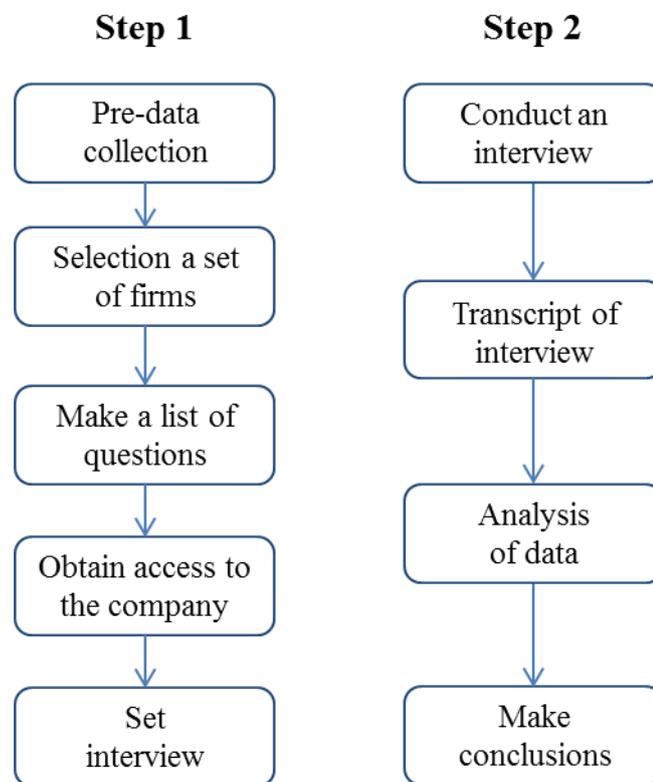


Illustration 3. Collection of data through interview

The opportunity to dive into the problem of the study lead to the need of cross-case comparisons, based on the real-life experience of Russian SMEs and results of interviews with companies' representatives. This method could be beneficial for the researches from the point of view that combination of methods allows the researcher to deeply explore the topic and find out the roots of the studying problem.

To gather relevant data there was developed a semi-structured interview. Researches show that individual interviews play very important role in collecting reliable data and can be more effective in collecting relevant data than any other qualitative approach (Bloom, 1988). Individual interview allows the researcher to collect more insights and explore the root-cause reasons of some events in the company. This approach involves respondents into more detailed discussion and more deep analysis of the topic. Finally, individual interview is a source of primary data that cannot be collected via open sources.

An average interview consists of 17 questions and lasts about 40-50 minutes. A structure of an interview consists of general attitude to simulation methods, about financial planning system of a company and about the effectiveness of traditional and simulation methods of financial planning. All these topics cover research questions of this study (Table 2).

Table 2 — Advantages and disadvantages of methods of short-term financial planning

Question number	Question
1	What was the main reason for implementing the simulation methods planning system in your company? Which factors drives this change?
2	At which level in the company simulation methods are used?
3	What was a driver of stating the use of simulation methods for short-term financial planning?
4	Which financial planning problems are addressed using simulating methods?
5	Which areas of financial planning are performed using simulation methods? Can you explain your choice?
6	What kind of data do you analyze using simulation methods? What kind of data still analyzed using traditional approaches? What are root-cause reasons for such a decision?
7	What problems do you revealed using simulation approach?
8	Can you compare traditional methods and simulating ones? Which method provides more quality of forecasts? Which is easier to use for everyday planning?

Continuation of table 2

9	What are constraints of developing simulation methods for the whole process of planning?
10	What factors (both financial and non-financial) effect on your company's success?
11	Can you prove how financial performance of the company is linked with planning?
12	Which financial indicators chose to focus on in your company?
13	Has the company achieved goals? Do simulation methods benefit the company?
14	Which KPI's in your company reflect the quality and effectiveness of financial planning?
15	Cost of implementing simulation method approach of financial planning has covered?
16	Which alternative effective methods of financial planning you know and recommend to use? Why?
17	How would you define the overall quality of short-term financial planning in Russia?

Source: Created by author

The author set several goals for interviews. Firstly, interviews were provided to collect view of practitioners on studying topic. These views probed by Russian business environment supported the author in developing this study and generating conclusions. Complex approach combined with both theory and practice allowed the author to develop analysis and chose criteria for regression model which fits well to studying topic and, as it was mention in the first chapter, to best explain peculiarities of Russian SMEs. Secondly, during interview were mentioned several short-term financial planning methods which currently used or being used for planning, thus the author created a final set of financial planning methods which were deeply analyzed in the first chapter. Finally, interviewees tested a list of factors which the author collected from several studies and prioritized them form the most relevant to financial success to the least ones. That helped the author to finalize the design of regression model.

Out of 15 interviews 3 were provided with CFO (chief financial officer), 2 with chief accountant, 7 with accountants (financial planning specialists) and 3 with operations specialists responsible for planning, thus we can conclude that knowledge received during these interviews

is applicable to this study and some concepts and conclusions proposed by the author were tested by responsible specialists regarding the validity and reliability of results.

2.2.2 Questioner

The second stream is survey mail-out. For the base were chosen 5-year alumni form database of Graduate School of Management consisting approximately of 3000 graduates of the said school. An addition, the survey was posted on business forums. Finally, several participants of the Ural economic summit were surveyed personally by the author of this research. The overall number of responses is 75 (out of 217 requests). Survey is pasted in appendix 1.

The questionnaire is structured in the following way:

1. Respondent's and company's profile. The section aims at gathering general information of the company including control variables such as export level, number of employees, in order to understand the profile of respondent.
2. Description of used in company methods of financial planning, its advantages and disadvantages and peculiarities of this method application.
3. Performance measurement. The last part is aimed at estimation of companies' performance. The performance is measured objectively using several financial indicators.

The survey was sent out via e-mail with a text and a link to it. The online survey was made based on SurveyGizmo platform. Before mail-out, the survey was piloted among few industry specialists to ensure its correctness and understandability according to the guidelines (Saunders et al. 2007).

2.2.3 Data collection and sampling

As it was stated before, the main goal of the study is to explain the relationship between the quality of a company's short-term financial planning and financial results within small and medium enterprises of Russia. It is important to recall that we limit our research by studying only SME, because large companies most likely has international operations and have access to modern knowledge, therefore, they are most likely use up-to-date approaches of financial

planning and has more opportunities to implement innovative solutions (because of high price of inventions and R&D). Also, we should remember that our analysis is focused on short-term financial planning, because it allows us to avoid market trends, competition within the economy and to cut effect of strategic decisions. Also, short period of time lead to small time gaps, thus results of any decision will appear fast.

According to the research constraints, the number of respondents is limited. Thus, in order to collect relevant information, we should follow next criterias:

- Use data of only Russian companies operating mainly on the Russian market;
- Only small and medium size enterprises, no matter the market share;
- Focus on leading industries in terms of GDP;
- Presence at the market of no fewer than 5 years (we need to minimize any biases and avoid slack of data for underdeveloped companies).

Thus, there were chosen 8 leading industries of the Russian economy and 20 companies from each industry with variable proportion of small to medium sized companies. Leading industries were chosen according the assumption that leading industries correspond to the overall situation in Russia. Moreover, the fact that were chosen 8 industries empowers the researcher to conclude that results of the study will be correct, more reliable and will be appropriate for any type of business. Some information was collected through open sources, databases and corporate sites, while some insight data were collected through interviews.

The research was conducted based on 8 leading industries of the Russian economy. Leading industries cover the majority of GDP of Russia and represent overall situation. The data was collected through several sources: primary data on websites, databases and GEM consortium.

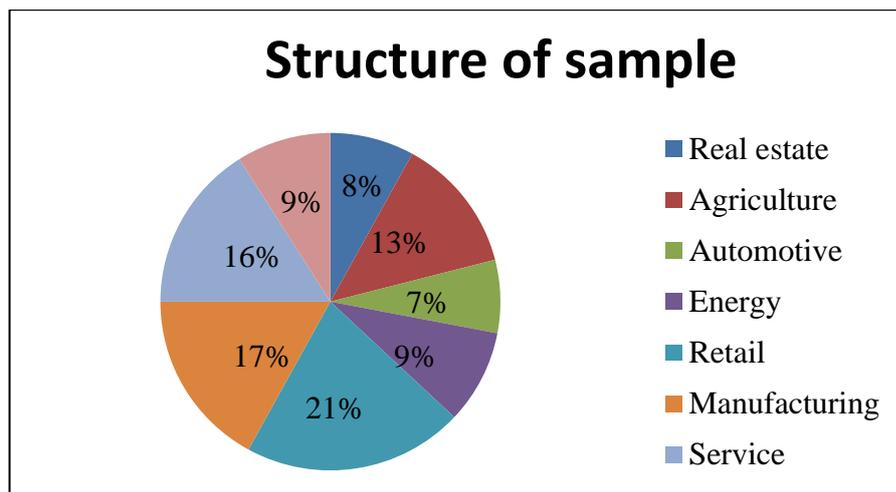
First step of data collection was data sampling of databases. Databases Passport GMID, Thomson Reuters and SPARK showed more than 15 000 companies from 8 leading industries. When we narrowed search to companies that exist more than 5 years, this number dropped to 7358 companies. There are about 3000 companies with missing information (these companies were cut from the study list). Outliers were treated as missing. Geographical distribution of companies is wide, but concentrated in two big hubs: Moscow (38%) and Saint-Petersburg (12%). We can underline high diversity of industries and geographical diversity of industrial clusters. Final analysis of collected data according to set of criterias mention above resulted in a

sample of 437 companies from 8 industries: real estate, agriculture, automotive, energy, retail, manufacturing, service and shipment. For all of the companies was gathered key information about performance, pace of growth, volume of operations, profitability and market share.

Second step was focused on collection of qualitative data. Both in-depth interviews and survey allowed the researcher to formulate a sample of companies which used traditional or simulating method of financial planning. A survey consists of short questions, such as 1) “Which method of financial planning use your company?”; and 2) “When and why your company changed financial planning approach?” Detailed description of questioner is in Appendix 1. The survey was sent to public e-mail of chosen companies and for 417 requests were collected 235 answers.

Third step was to combine two samples in order to create a set of companies which are appropriate to the constraints of the study and also has no missing values. Were taken 75 responses from GSOM graduates and 235 responses from survey stream. Finally, for creation of final sample were used methods of replicating of sample and extrapolating of values. Finally, in STATA 13.0 software the dataset was modified by eliminating outliers. The final sample included 174 small and medium size companies. The biggest portion of companies was from retail (21%) and manufacturing (17%) (Illustration 4).

Illustration 4. Industrial structure of the final sample



2.3 Time horizons

Time horizon of this research reflects the key objective of the study – to find out differences on firms' performance through years. As far as differences are explained with characteristics of financial planning approaches providing within the stable sample. Time horizon reflects three and five-year changes in financial performance of companies. Along with the research design which is based on analysis of changes of performance within the same set of companies, analysis is considered as a panel data. According to (Saunders et al, 2007), there are three most used time lines of research, the research can be built under panel data, time horizon or longitudinal manner, which is known as panel, in accordance with its “day-to-day” analysis.

Qualitative studies considered as fastidious long-term research. However, time horizon limitations and academic reasons reflect the main borders on conducting long-term study. Time constraints and academic schedule limit the longitude of the study and theoretical background. Fast-developing scientific society provides more and more studies on behalf of the topic of the study, and this research builds a theoretic background and formulates the research gap accordingly to the present amount of literature and writings.

2.4 Evaluation criteria and validity

“Validity is the correctness or credibility of a description, conclusion, explanation, interpretation, or other sort of account” (Maxwell, 2005). Validity is not based on the methods of study, but on the “objective truth”. Validity of this research doesn't prove the ultimate truth about the studying object, but provides reasons which prove credibility of the study. In this study were used up-to-date data, the data collection process was well organized and all collected information were proceeded in order to avoid misinformation and extra ordinal values. In order to provide validity of the quantitative research, we tried to avoid two the most common threats: researcher bias and reactivity (Maxwell, 2012).

Maxwell defines research bias as the process of selective data collection in order to firstly, collect data that perfectly fit researcher's existing theory, goals and hypotheses and secondly, to find out the most suitable outliers and come up with totally predicted results. To avoid such a threat, we collected wider range of data. Moreover, our sample consists of carefully selected data according to limitations of the study and the research question.

Reactivity can be defined as tendency to copy the style and strive to come up with similar results. Maxwell notes that it happens because of influence of studied materials on the author and also as personal influence of the researcher on the setting or individuals during the interview. To avoid this threat, we combined qualitative data from two sources: personal interviews and questioner. Also, we should mention that questioner was established in the most delicate manner in order to avoid pressure on interviewer and emotional misbalance.

This research's validity can be proved on Yin's four criteria approach to judge the quality of the research: construct validity, internal validity, external validity and reliability.

The founder a method for determining the reliability of tests (Cronbach, 1955) states that, "the best construct is the one around which we can build the greatest number of inferences, in the most direct fashion". Construct validity refers to test quality measures. In our research we maximized construct validity by using a wide range of sources, representative sample consisting of 437 companies from 8 leading industries. Also, validity improved by expert interviews with managers of 15 companies and questioner that collected 135 responses.

Internal validity reflects the truth of causal relation between variables (Shadish, 2002). Our research is causal and explanatory, thus internal validity is proved with the fact that this study identifies and explains factors that affect the effectiveness of a company's financial planning.

External validity represents generalized inferences in research or in other words, which results of the study can be generalized and used in other studies (Aronson, 2007). Probably, we can be somewhat wrong in making generalization due to limitations of the research and specifics of methods of the study. Finally, the research was conducted on Russian companies' data and, eventually, the results of the study can be not applicable to other countries due to peculiarities of doing business in Russia. To avoid this negative scenario, we provided our research with representative data. Also, we used a set of three methods in order to generate crossing outcomes.

Reliability reflects the validity of replication of the study (Ritter, 2010). Reliability of this study cannot prove that replication of the study will be identical, but the author tried to avoid researcher-biases and possible influence of data collected in order to ensure high quality of research.

2.5 Limitations of study

Due to academic reasons this research is limited, thus we should account for some specific limitations of this analysis. To start out, we should mention limitation of time and the size of the sample. Academic schedule affected the research in terms of limited time for data collection and research execution. Limited time lead to limited number of respondents, shortened amount of observed companies and short duration of qualitative study. Strict deadlines limited our possibilities to collect and observe more data and if there was not so short time for research, we could even extend the scope of our study and analyze more industries and reveal regional specifics and season dynamics.

Regarding the specifics of survey, some factors were estimated by companies and cannot be measured by the author to prove their validity and objectivity. For factors, such as number of talents, level of competition and ease of financing, which were estimated judgmentally, we should be accurate in conclusions. The author proposes to provide deep analysis of effects of these factors on financial performance of companies in future, but in terms of current study this analysis is out of scope.

Only 15 interviews were conducted due to specifics of the data sample. Interviews were conducted with top-level managers of Russian small and medium size companies. Finally, we should notice that our research can be somewhat subjective according to the fact that some of conclusions were made are based on questioner and interview. This methodology is based on use of qualitative data which is generally containing an inevitable portion of subjectivism.

2.6 Summary of Chapter 2

In the Chapter 2 we revealed the methodology of the study that is used in this research. Methodology consists of two main elements: in-depth interview and panel data analysis.

We have also explored the subject of this study and decided that exploratory research should be based on real-life evidences, collected through interview and survey approaches.

Research questions also were defined in this chapter. Research questions that target the problem of choice of financial modelling approach were covered. We decided to cover the nature of research questions by using optimal combination of methods with focus on analysis of both primary and secondary data. Also, the complexity of the problem and unavailability of relevant data forced us to build research design with use of combination of quantitative and qualitative data, such in-depth interview and survey.

Besides the main purpose of this research, there were defined limitations of data use, advantages and disadvantages of methods and was introduced approach to deeper understanding of peculiarities of implementation and use of simulation methods of financial planning.

Finally, the whole process of data collection is illustrated in this chapter.

Chapter 3. EMPIRICAL STUDY

3.1 Research design and operationalization of variables

Based on previous researches on financial planning, the model for testing the hypotheses stated above was developed with a group of independent variables in order to diminish specification bias. The linear regression model was used to test the hypothesis. In this model, the variables specifying a type of financial planning methodology used in a company (fundamental method or modern method), as well as those, characterizing company's financial results (ROE, net profit margin, level of cash gap) along with control variables representing additional financial and non-financial data about a company (company age, size of the company, growth rate) were analyzed. The variables have been selected drawing on past studies about financial planning and characteristics of different methodology of planning. It was especially useful to analyze researches that were considering the following variables: size of a company (Mabert, 2003), firm age (Forbes and Milliken, 1999), growth rate (Ouakouak, 2015), return on investment (Glaister, 2008), net profit margin (Huang, 2009), cash gap (Georgescu, 2010; Bennouna, 2010) and level of competition (Kemayel, 2015). Four useful measures of firm profitability are the rate of return on firm assets (ROA), the rate of return on firm equity (ROE), operating profit margin and net firm income (Crane, 2010).

More and more studies are delighted to analysis of conceptual factors affecting the success of the company or, in other words, SME performance. Thus, in the study (Sidik, 2012) the author puts on the table an idea that innovative performance and innovative capacity are key factors describing SME development. The main purpose driving a firm to innovate is to increase its competitiveness in its chosen markets and to obtain improved business performance. Therefore innovating performance refers to the extent to which firms actually introduce their innovations to the market, i.e. the rate of new products launching, new processes or new devices (Hagedoorn and clouds, 2003), it also refers to the extent to which a firm's new products meet their financial and market goals (Wang and Lin, 2012).

Several studies (Anggadwita and Mustafid, 2014; Lampadariou, 2016) refers to the value of human capital and talents in a company. These studies reveal the effect of human capital on company's performance. Factors such entrepreneurial behavior (motivation, optimism, self-efficiency of people), competence of human resources and performance of people show significant effect on growth of SMEs. Other studies analyze this topic from the managerial point

of view, where the most impactful factors related to human resources are management skills, personal efficiency, knowledge, planning skills and leadership (Trang, 2015).

The research was conducted in order to acknowledge the relationship between the use of different approaches of short-term financial planning and financial performance of Russian small and medium sized companies. The following regression model was used in order to test two hypotheses provided in Chapter 1. The choice of this model is based on the existing studies on similar topics, in which linear regression model was used in order to assess the influence of financial planning method on a company's financial results (Albrecht & Steinrücke, 2017; Messer, 2017; Bielialov, 2016; Rasoto, Ishikawa & Stankowitz, 2016).

Finally, the most recent studies focus on factors that are on the forefront of internationalization of companies. Thus, along with traditional performance factors, authors (Ensari and Karabay, 2015) study ease of financing as one of key factors determining success of SMEs.

Finally, based both on recent studies focused on analyzing factors of SME performance and interviews with Russian companies' CEOs we developed a list of parameters: size of the company, age, ROE, NPM (net profit margin), cash gap, growth rate, level of competition, share of innovations, number of talents and ease of financing. We have conducted hierarchical linear regression with two stages to analyze our models. This type of the regression allows estimating how addition of new variables influences the model fit as assessed by R square change. However, the addition of new variables is based on theoretical grounds (Pallant and Manual 2007). At first stage we build the base model in order to check significance of the model and come up with final set significant factors which explain interconnections within our set of data (sample). We accept that some factors could be non-significant due to limitations of the study or other factors describing the specifics of Russian companies.

Thus, within first step only control variables were added as predictors; while performing the second step we increased the complexity of model by addition of proposed within theoretical review variables. Based on the results, we compared models' fit and selected the best one. The models of the regression are built according to design presented in Equations 1-4 regarding three steps of basic model and final extended model below, while the description of the variables used within equations can be found in Table 5.

Base model, first step:

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + \varepsilon \quad (1)$$

Model 1. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when b_1, b_2, b_3 are presenting unknowing coefficients in a linear regression equation.

Base model, second step:

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + b_4 \text{CGap} + b_5 \text{Growth} + b_6 \text{Inn} + \varepsilon \quad (2)$$

Model 2. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when b_1, b_2, b_3, b_4, b_5 and b_6 are presenting unknowing coefficients in a linear regression equation.

Base model, third step:

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + b_4 \text{CGap} + b_5 \text{Growth} + b_6 \text{Inn} + b_7 \text{Comp} + b_8 \text{Tal} + b_9 \text{Efin} + \varepsilon \quad (3)$$

Model 3. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when $b_1, b_2, b_3, b_4, b_5, b_7, b_8$ and b_9 are presenting unknowing coefficients in a linear regression equation.

Expanded model:

$$Y = b_0 + b_1 \text{Method} + b_2 \text{Size} + b_3 \text{Age} + b_4 \text{NPM} + b_5 \text{CGap} + b_6 \text{Growth} + b_7 \text{Inn} + b_8 \text{Comp} + b_9 \text{Tal} + b_{10} \text{Efin} + \varepsilon \quad (4)$$

Model 4. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when $b_1, b_2, b_3, b_4, b_5, b_7, b_8, b_9$ and b_{10} are presenting unknowing coefficients in a linear regression equation.

Since this type of regression is quite sensitive to unconditional data, few assumptions have to be met before the test can be performed. The assumptions of it are the following independence of errors, homoscedasticity, normality of errors, absence of multicollinearity and outliers (Tremblay, 2013). Therefore, we checked if the data is correspondent to the assumptions of hierarchical multiple regression analysis and transformed it where required, e.g. through calculating logarithms from company's age and size of a company to secure normal distribution.

The variables used within the two models are approximately the same, therefore they are presented below in Table 5.

Table 5. Description of variables used in analysis

Variable name	Variable descriptions and measure	Type of variable
Dependent variables used in the analysis		
ROE	Ratio that indicates firm's profitability. It was calculated as net profit divided by total equity	Count
Independent variables used in the analysis		
Method	Method of financial planning that used in a company	Binary
Size	Size of a company is the amount of yearly revenue	Count
Age	Logarithm of company's age	Continuous
NPM	Net Profit Margin of a company. It was calculated as net profit divided by revenue	Count
CGap	Cash gap represents the number of days t between the dates of paid cash and received cash	Count
Growth	Logarithm of company's growth rate	Continuous
Inn	Logarithm of share of revenue gained through innovations (technology, business model or R&D)	Continuous
Comp	Level of competition is an estimation from 1 to 5	Count
Tal	Logarithm of share of talents in company's staff	Continuous
Efin	Ease of financing is an estimation from 1 to 5	Count

Source: Created by author

Several control variables were included in the analysis. Age and growth rate were controlled because they can serve as signals to the researcher that company is successful in realities of Russian business atmosphere, hence, potential risks can be diminished through it. Also, sector of a company was included into the model as country dummy variables for each industry presented in the sample (Table 6).

Table 5. The description of the dummy variables that represent the industry

Dummy name	C1	C2	C3	C4
Industry	Real estate	Agriculture	Retail	Automotive
Dummy name	C5	C6	C7	C8
Industry	Energy	Manufacturing	Service	Other

Source: Created by author

3.2 Model specification

Dependent variables are of the same type, thus, singular regression model was applied. Linear regression model assumes normally distributed and homoscedastic errors and with count variables these assumptions are violated. For this type of variables negative binominal regression is more applicable (Hausman, Hall and Griliches 1984). The error occurred during the process due to complexity of the model. In order to regress dependent variables and simplify the model, the dummy variables of countries were dropped.

Breusch-Pagan Lagrange multiplier, Wald test, Hausman test and F-test were used to test regression models for random and fixed effects respectively and pooled regression model (Breusch and Pagan, 1980).

Cross sectional data models investigate the relationship between independent and dependent variables within an individual (country, company, etc.). Each individual has its own properties and characteristics that may or may not influence the independent variables. Since the model tests the effectiveness of different methods of financial planning, was used paired-sample regression for cross-sectional data.

Because the models are linear, they were checked for heteroskedasticity and serial correlation. Modified Wald test for group wise heteroskedasticity in paired-sample regression model was applied and heteroskedasticity wasn't identified. For the model there is no autocorrelation was detected.

3.3 Descriptive statistics

Before the analysis, we have screened the data, checked for errors and changed in order to meet the assumptions of the multiple regression, that included ensuring the absence of outliers, independence of observations, linearity of relationship, homoscedasticity of residuals, and absence of multicollinearity (Tremblay 2013). After the said procedures the sample of 174 observations remained for the further analysis.

All the data analysis was performed within STATA 13.0 software. Descriptive statistics of the sample is represented in Table 7. Most of standard deviations are higher than means which is a sign of over dispersion of the data. Low means of independent variables show that zero values dominate in the sample during examined period of time.

Table 7. Descriptive statistics of the variables

Variable	Mean	Standard deviation	Min	Max
Age	12.359	14.921	5	23
Size	73 829 135	67 324 589	8 350 000	480 670 800
Growth	0.068	0.092	- 0. 24	0.35
Method	0.427	0.564	0	1
ROE	0.067	0.082	0.003	0.37
NPM	0.16	0.22	0.006	0.45
Gap	42	34	10	74
Comp	3.42	1.2	1	5
Tal	0.12	0.21	0.04	0.34

Inn	0.11	0.12	0.01	0.18
Efin	3.15	1.34	1	5

Source: Created by author

Correlation matrix is represented by Table 8. Given some high correlations, there is a hazard of multicollinearity. Belsey et al. (1980) argues that multicollinearity is a serious issue when dependent variables have a variance-inflation factor (VIF) higher than 10. For each model VIFs were checked and only control variables showed large VIFs. In this case the multicollinearity can be safely ignored (Allison 2012). Several correlations appeared naturally due to the nature of the data (68% correlation between the size of a company and the age). Medium correlation between the growth rate and the age of a company reflects specifics of the sample and current business environment, because the majority of experienced firms always have more opportunities to grow in crisis. Strong positive correlation between the method of financial planning and the growth rate demonstrates, in our point of view, that the pace of growth can be partially explained with the quality of financial planning and financial planning method. Natural correlation between return on equity (ROE) and the pace of growth and net profit margin (NPM) and ROE reflects that fast-growing companies in average show higher return on investment. Such a behavior is typical for IT, Real Estate and Retail industries.

Table 8. Correlation matrix of the variables (Significance level: * - $p < 0,001$)

	1	2	3	4	5	6	7	8	9	10	11
Age	1										
Size	0.68*	1									
Growth	0.53*	0.36*	1								
Method	0.17*	0.27*	0.67*	1							
ROE	0.37*	0.44*	0.58*	0.14*	1						
NPM	0.25*	0.17*	0.23*	0.17*	0.84*	1					
Gap	0.09	0.12*	-0.36*	-0.26*	0.22*	0.37*	1				
Comp	0,06	0,08*	0,07*	0,11*	0,01	0,01	0,01	1			

Tal	0,09*	0,13*	0,10*	0,16*	0,03	0,05	0,04	0,08*	1		
Inn	0,04	0,05	0,03	0,04	0,03	0,03	0,03	0,05	0,06	1	
Efin	0,03	0,04	0,04	0,05	0,01	0,03	0,02	0,05	0,03	0,46*	1
C1	0,04	0,05	0,03	0,04	0,03	0,03	0,03	0,05	0,03	0,07	0,04
C2	0,03	0,04	0,04	0,05	0,01	0,03	0,02	0,06	0,01	0,15*	0,16*
C3	0,05	0,06	0,05	0,06	0,01	0,01	0,01	0,01	0,02	0,01	0,08*
C4	0,03	0,02	0,04	0,05	0,01	0,03	0,05	0,11	0,02	0,07*	0,03
C5	0,04	0,06	0,03	0,04	0,02	0,03	0,03	0,04	0,02	0,00	0,03
C6	0,06	0,09*	0,03	0,05	0,03	0,02	0,01	0,05	0,04	-0,03	0,16*
C7	0,04	0,06	0,03	0,04	0,02	0,03	0,03	0,04	0,02	0,02	0,01
C8	0,03	0,05	0,09*	0,14*	0,02	0,02	0,03	0,00	0,01	0,20*	0,41*

Table 8. Correlation matrix of the variables (Significance level: * - $p < 0,001$)

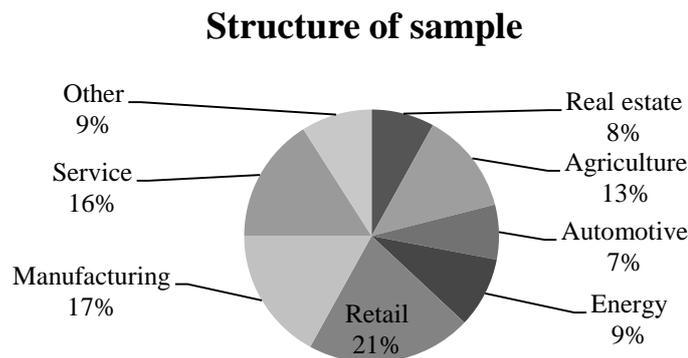
	12	13	14	15	16	17	18	19
C1	1							
C2	0,04	1						
C3	0,02	0,04	1					
C4	0,03	0,07	0,03	1				
C5	0,01	0,03	0,01	0,02	1			
C6	0,03	0,08*	0,03	0,06	0,02	1		
C7	0,01	0,03	0,01	0,02	0,01	0,02	1	
C8	0,02	0,05	0,02	0,04	0,02	0,04	0,02	1

Source: Created by author

In our sample industries were classified according to Russian tax classification. Six industries account for approximately 84% of the whole sample. The prevailing one is retail

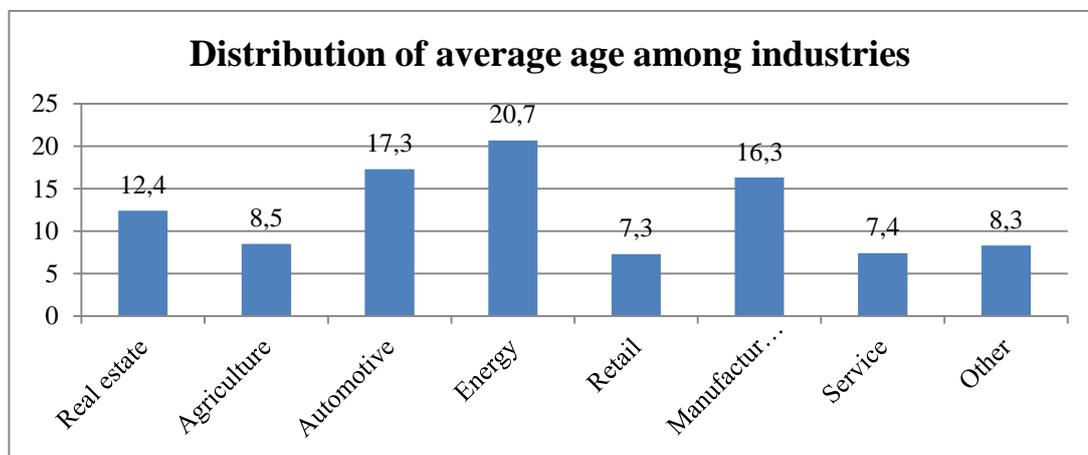
having 21% of all data that can be explained with the fact that more than third of preliminary set of responses were collected from retail companies. The following most responses-heavy industry is manufacturing and service with 17 % and 16 % respectively. These two industries are followed with agriculture industry that accounts for significant part of the sample, 13%. Real estate and energy sector represent fifth and sixth the most responses heavy industries, each accounting for approximately 8% (Illustration 5).

Illustration 5. Distribution of responses by industry



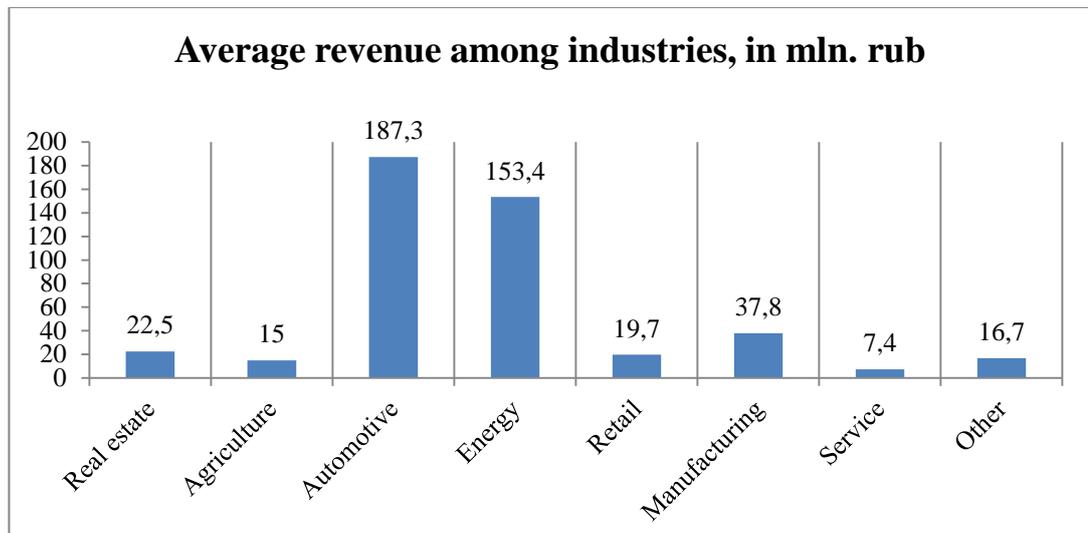
Average age of a company within the observed sample is 12,3 years, which means that in average observed companies operates more than ten years and has necessary business experience, which is sufficient while analyzing the relationship between financial planning and financial performance of companies. Illustration 6 represents distribution of average age of a company among different industries. The most adult industry is energy with the average of 20,7 years, while the youngest are retail and service with 7,3 and 7,4 years respectively.

Illustration 6. Distribution of average age among industries in years



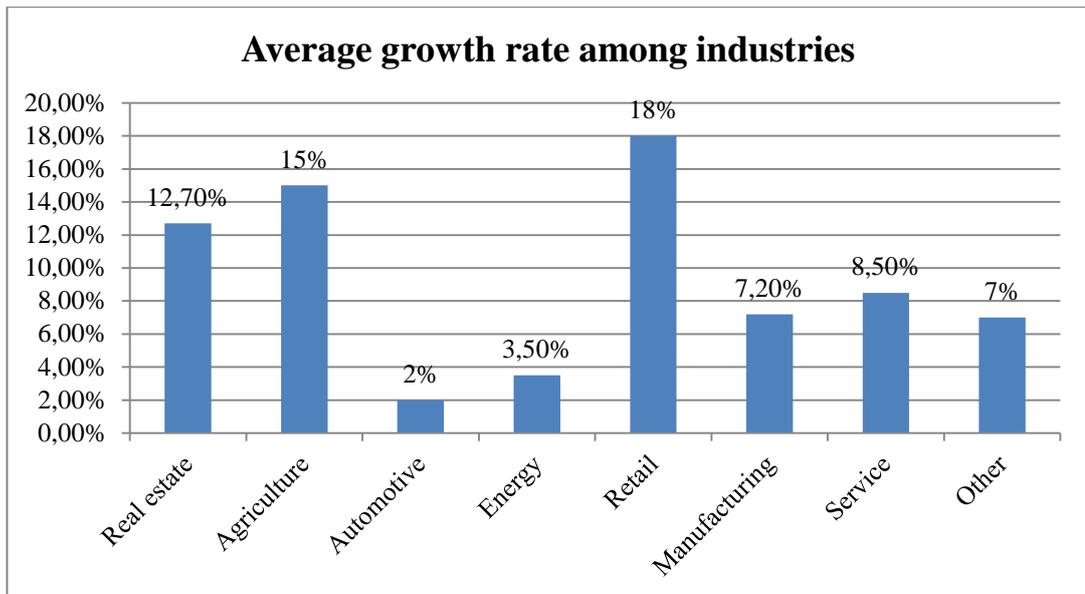
Average size of a company, which is estimated as the amount of revenue is 53 829 135 rubles, which is characterizes observed companies as medium sized according to Russian Tax system classification. Illustration 7 provides information about distribution of average revenue among observed industries. Distribution reflects three clusters: large-size companies from automotive and energy industries with average annual revenue of 187,3 and 153,4 million rubles; medium-sized companies form real estate, agriculture, retail, and manufacturing; and small-sized companies from service industry with the average revenue of 7,4 million rubles.

Illustration 7. Distribution of size of a company among industries in million rubles



Average growth rate among observed companies is 6,8%, which is three times higher than average GDP growth. The most growing companies easily achieve double-digit growth rate, while laggards show negative growth. Illustration 8 provides information regarding average growth rates among observed industries. We can identify three clusters according the pace of growth: 1) fast growing industries, such real estate (12,7%), agriculture (15%), and retail (18%); 2) industries showing medium growth rates: manufacturing (7,2%), service (8,5%) and other (7%); 3) slowly growing industries: automotive (2%) and energy (3,5%).

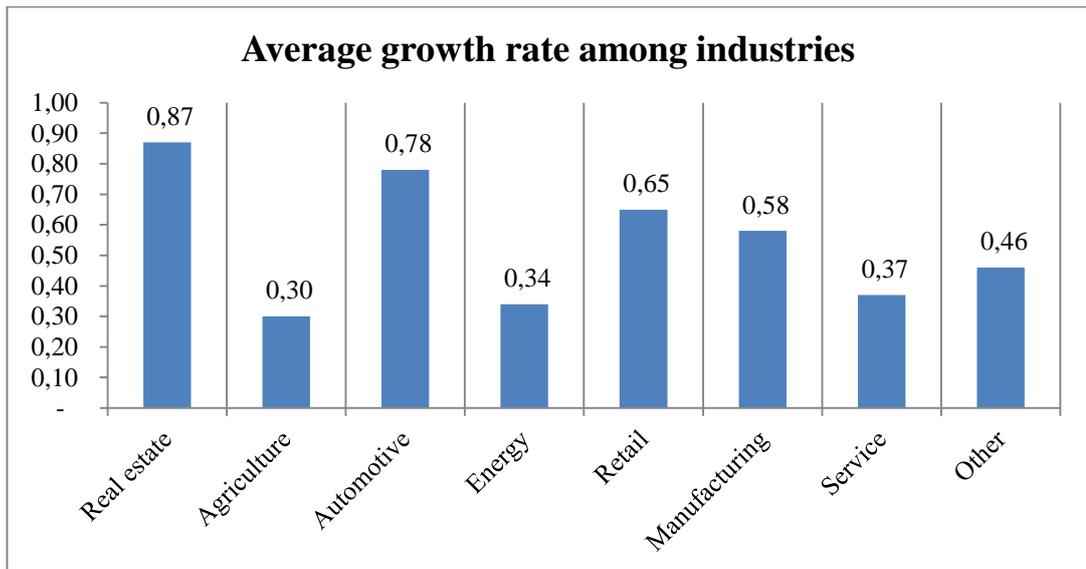
Illustration 8. Distribution of average growth rate among industries



Analysis of method of financial planning used is based on analysis of binary data. Our model developed in such a way that if a company uses modern methods of financial planning, the value is 1, otherwise, in case of using traditional methods, the value is 0. Illustration 9 reflects distribution of average method used criteria among observed industries.

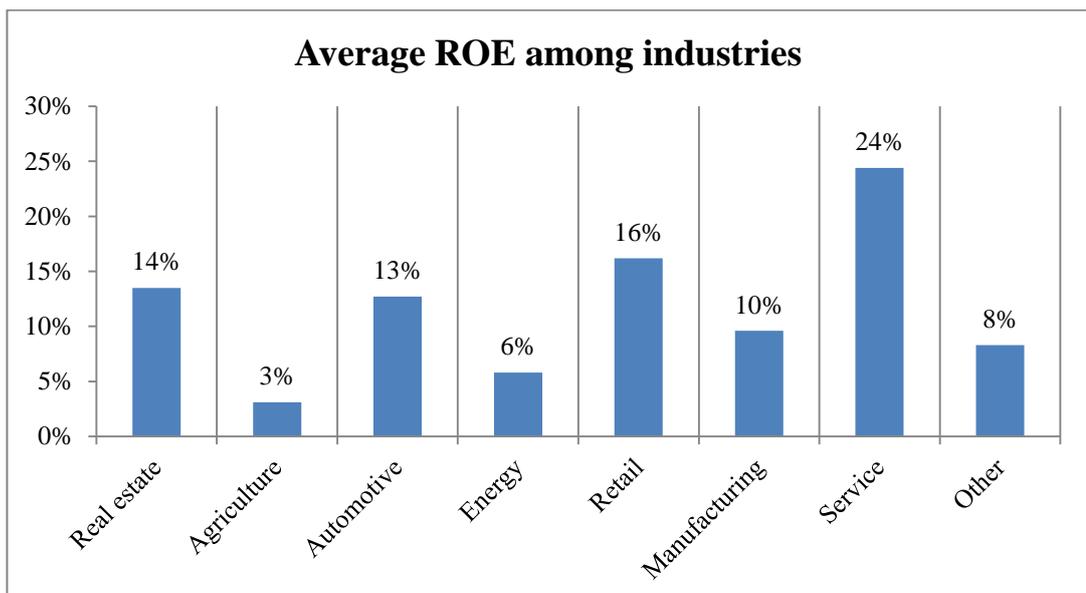
This value is one of the most important for our research. This value reflects average development of financial planning methods in Russian business environment. The mean value is 0,427, which means that in average less than 43% of Russian small and medium sized companies use modern approaches of financial planning. Situation changes dramatically when we deep into more detailed analysis. We can define two opposite clusters of industries. Developed industries: real estate (0,87), automotive (0,78), retail (0,65) and manufacturing (0,58); and underdeveloped: agriculture (0,3), energy (0,34), service (0,37). This significant difference can be explained by the soviet heritage of certain industries, which traditionally use fundamental methods and are not ready for the change. Also, some companies operate in not so competitive environment, which leads to low level of uncertainty and lower risks, thus, use of modern method of financial planning is not necessary for successful results.

Illustration 9. Distribution of average value of the method criteria among industries



Average ROE of the companies observed is equal to 6,7%, which means that on average, companies were generating profit during the period observed that was equal to 6,7% of all the money invested by shareholders. Minimum value equals almost to zero, which identifies that a company was not able to use its resources for generating any profit. As for maximum value of ROE, the profit generated by a company accounts for 37% of shareholders' equity. Distribution of average ROE among industries that were investigated is presented in Illustration 10.

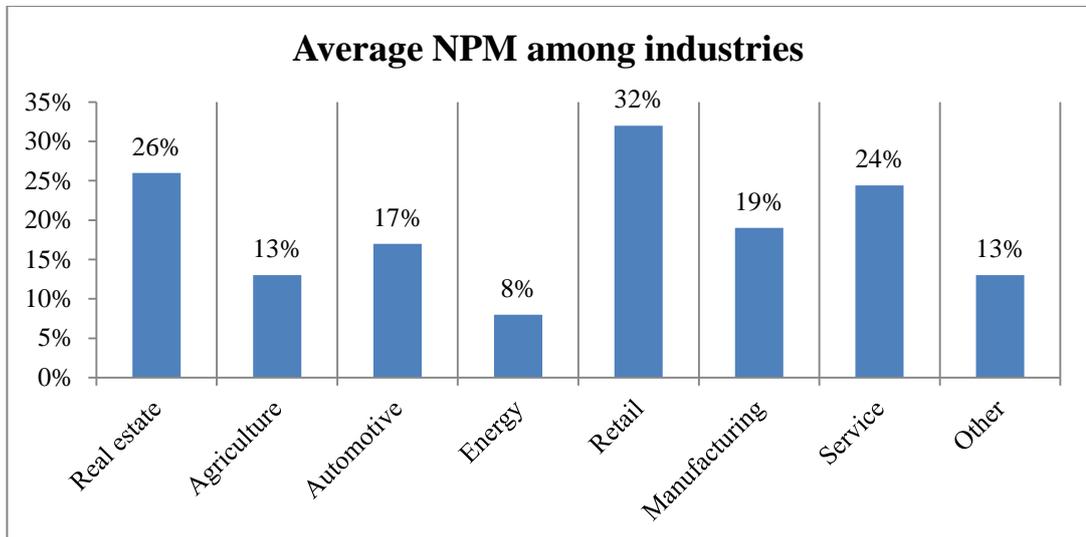
Illustration 10. Distribution of average ROE among industries



Net Profit Margin of observed companies is 16%. Minimum value equals almost to zero, while the most successful company showed 45% profit margin. Distribution among the observed

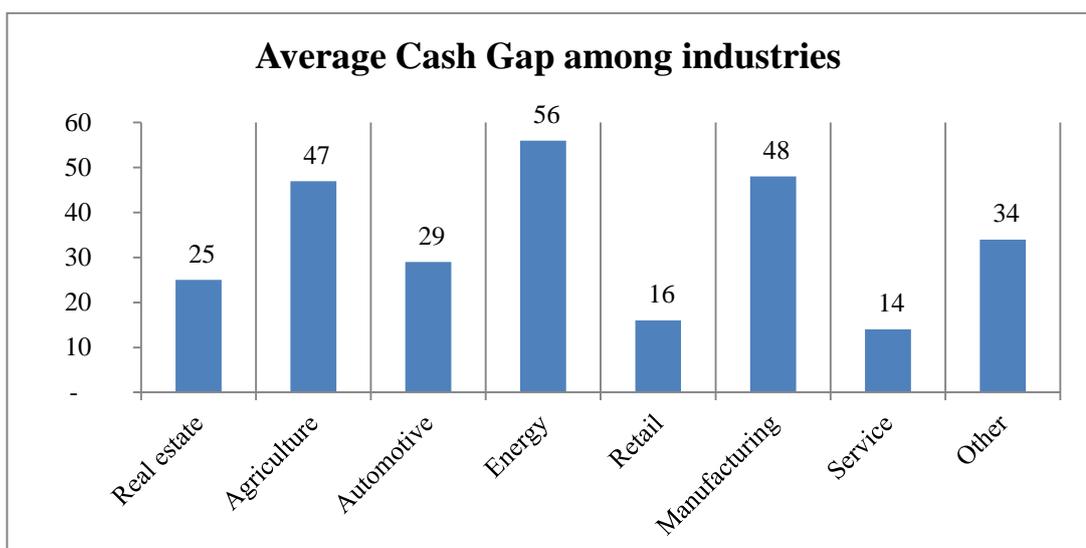
industries reflects standard case where companies with short cash turnover period reflect the biggest profitability, while in fact turnover of heavy industries limits their profitability (Illustration 11).

Illustration 11. Distribution of average Net Profit Margin among industries



Average cash gap of observed companies is 42 days. It means that an average company needs to cover the lack of cash for the period of 42 days. The most successful companies show cash gap about 10 days, while the least successful work under more than 70 days lack of cash. Illustration 12 reflects the distribution of average cash gap among industries.

Illustration 12. Distribution of average Cash Gap among industries, in days



3.4 Hypotheses testing and analysis

As it was mentioned before, before testing each of two hypotheses (table 9) were built three base models, which describe the relationship between the method of financial planning used in a company and financial performance. The panel data for the sample of 174 companies, of which 75 companies use modern methods of financial planning. The multiple linear regression models were used in order to run the analysis. Regression analysis was performed using STATA 13 software package.

Linear regression appeared to be the best model for the dependent variable – return on equity. After conducting regression analysis, each variable was checked for significance accordingly to the hypothesis formulated before. The results of the base model regression analysis are shown in tables 10, 11 and 12.

Table 9. Hypotheses of the study

Hypothesis 1	Use of simulation (modern) methods of short-term financial planning has a positive relation with company's financial performance.
Hypothesis 2	Companies that use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

3.4.1 Base mode testing

Base model is designed to measure whether different parameters have significant influence over a company's financial performance, explained through financial indicator - return on equity. Base model examines whole sample regardless the method of planning. As it was said before, the model was tested in three following steps:

1. In the first step we tested only base variables, the age of a company, its size and net profit margin;
2. In the second step we added those financial performance indicators that were proposed to affect financial performance of a company: level of cash gap, growth rate and share of innovations;

3. Finally, in the third step we added three more factors which could affect financial performance of the company: level of competition, number of talents and ease of financing.

Regression models were built according to design presented in equations 1-3 below, while the description of the variables used within the equation can be found in Table 5.

Base model, first step

Model testing on the first step is presented in equation 1.

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + \varepsilon \quad (1)$$

Equation 1. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when b_1 , b_2 and b_3 are presenting unknowing coefficients in a linear regression.

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 10. Model proved to be statistically significant ($p < 0,01$). However, all variables proved to be statistically significant ($p < 0,05$). Autocorrelation level as assessed by Durbin-Watson proved to be acceptable (1,654, whereas acceptable level is from $1.5 < t < 2.5$). Stage 1 model including three variables is able to explain only 32,8% of variance.

Table 10. Description of regression results for the first step of base model creation

Variables	Coefficients	
	Step 1	p-value ($P > t $)
(Constant)	4,24	0,000
Size	1,35	0,000
Age	0,370	0,008
NPM	11,2	0,000
R^2	0,386	
Adjusted R^2	0,318	
Sig.	0,001	

Source: Created by author

Base model, second step

Model testing on the second step is presented in equation 2.

$$Y = b_0 + b_1\text{Size} + b_2 \text{Age} + b_3 \text{NPM} + b_4 \text{CGap} + b_5 \text{Growth} + b_6 \text{Inn} + \varepsilon \text{ (2)}$$

Equation 2. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when b_1, b_2, b_3, b_4, b_5 and b_6 are presenting unknown coefficients in a linear regression.

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 11. Model proved to be statistically significant ($p < 0,01$). However, variable Inn created unacceptable autocorrelation level as assessed by Durbin-Watson (2,654, whereas acceptable level is from $1.5 < t < 2.5$) and should be deleted from final model. Stage 2 model including six variables is able to explain 68,8% of variance, within it variable Inn wasn't statistically significant. When the complexity was increased by adding financial and non-financial performance indicators, the model fit drastically rised, indicating the correctness of theoretical review made. The subsequent addition of variables increased the model fit.

Table 11. Description of regression results for the second step of base model creation

Variables	Coefficients	
	Step 2	p-value ($P > t $)
(Constant)	2,31	0,000
Size	1,23	0,000
Age	-0,144	0,01
NPM	7,12	0,000
Cgap	0,78	0,006
Growth	0,423	0,000
Inn	-0,073	0,76
R ²	0,723	
Adjusted R ²	0,608	

Sig.	0,004	
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Source: Created by author

Base model, third step

Model testing on the second step is presented in equation 3.

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + b_4 \text{CGap} + b_5 \text{Growth} + b_6 \text{Inn} + b_7 \text{Comp} + b_8 \text{Tal} + b_9 \text{Efin} + \varepsilon \quad (3)$$

Equation 3. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when $b_1, b_2, b_3, b_4, b_5, b_6, b_7, b_8$ and b_9 are presenting unknown coefficients in a linear regression.

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 12. Model proved to be statistically significant ($p < 0,01$). However, three variables: Inn, Tal and Efin proved to be statistically insignificant and should be excluded from final model, because these factors doesn't explain. Stage 3 model including nine variables is able to explain 79,8% of variance. When the complexity was increased by adding all financial and non-financial performance indicators, the model fit improved, indicating the correctness of theoretical review made.

Table 12. Description of regression results for the third step of base model creation

Variables	Coefficients	
	Step 2	p-value ($P > t $)
(Constant)	1,51	0,000
Size	1,14	0,000
Age	-0,12	0,000
NPM	4,1	0,006
Cgap	1,2	0,000
Growth	0,53	0,000

Inn	-1,073	0,896
Comp	0,206	0,004
Tal	-0,48	0,679
Efin	0,78	0,944
R ²	0,77	
Adjusted R ²	0,698	
Sig.	0,005	

Source: Created by author

The subsequent addition of variables increased the model fit, thus the author decided to include six statistically significant variables (Size, Age, NPM, Cgap, Growth and Comp) to final model, because only these factors explain variability of dependent parameter.

3.4.2 Hypothesis 1

The model is designed to measure whether modern (simulation) methods of financial planning have significant influence over a company's financial performance, explained through financial indicator - return on equity to test the proposed relationship. This model examines only samples with method variable equal to "1" (a company use modern (simulation) methods of financial planning). As it was said before, sample for this model consists of 75 companies. The model is shown in equation 4.

$$Y = b_0 + b_1 \text{Size} + b_2 \text{Age} + b_3 \text{NPM} + b_4 \text{CGap} + b_5 \text{Growth} + b_6 \text{Comp} + \varepsilon \quad (4)$$

Equation 4. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when b_1, b_2, b_3, b_4, b_5 and b_6 are presenting unknowing coefficients in a linear regression.

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 13. Model proved to be statistically significant ($p < 0,01$) as well as all independent parameters ($p < 0,05$). The model was assessed for heteroskedasticity and autocorrelation. White's test for heteroskedasticity has two-sided F (Fisher) distribution. As far as value $p(F) = 0,000$ and is lower than critical value (0,05) with

given level of significance, the null hypothesis is accepted, so heteroskedasticity is considered insignificant (random errors are most likely homoscedastic). Durbin-Watson test for autocorrelation showed t-statistic equal to 1,74, which lays exactly in the acceptable level (from $1.5 < t < 2.5$), so we can conclude acceptable level of autocorrelation in the model.

Model, including 6 independent variables tends to explain 78% of the variance. Model confirmed hypothesis 1 with high levels of significance. The results demonstrate that hypothesis 1 is supported with $p < 0,01$ significance level, thus we can conclude that simulation (modern) methods show strong positive relation to financial performance of a company.

Table 13. Description of regression results for 1st hypothesis testing model

Variables	Coefficients	
	Model 1	p-value (P > t)
(Constant)	0,25	0,000
Size	-0,19	0,01
Age	0,2	0,000
NPM	1,77	0,000
Cgap	0,344	0,002
Growth	0,45	0,000
Comp	-0,178	0,000
R ²	0,712	
Adjusted R ²	0,624	
Sig.	0,000	

Source: Created by author

3.4.3 Hypothesis 2

The model is designed to measure whether simulation (modern) or fundamental (traditional) methods of financial planning have significant influence over a company's financial performance, explained through financial indicators of return on equity. This model examines whole sample with method variable equal to "1" (for companies using modern (simulation) methods of financial planning) and "0" (for companies using fundamental (traditional) methods of financial planning). The model is presented in equation 5.

Expanded model:

$$Y = b_0 + b_1 \text{Method} + b_2 \text{Size} + b_3 \text{Age} + b_4 \text{NPM} + b_5 \text{CGap} + b_6 \text{Growth} + b_7 \text{Comp} + \varepsilon \quad (5)$$

Equation 5. Regression equation, where b_0 is perceived to be an unknown scalar quantity, when $b_1, b_2, b_3, b_4, b_5, b_6,$ and b_7 are presenting unknowing coefficients in a linear regression.

Pooled regression model

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 14. Model proved to be statistically significant ($p < 0,01$) as well as all independent parameters ($p < 0,05$).

Table 14. Description of pooled regression results

Variables	Coefficients	
	Model of pooled regression	p-value ($P > t $)
(Constant)	0,35	0,000
Method	-0,31	0,002
Size	0,34	0,000
Age	0,24	0,000
NPM	2,21	0,000
Cgap	-0,44	0,021

Growth	-0,18	0,000
Comp	0,068	0,000
R ² within	0,682	
R ² overall	0,549	
Sig.	0,000	

Source: Created by author

Results show different coefficients for independent variables in comparison to base model. As far as coefficient of the main variable is below 0, we should reject our null hypothesis and conclude that companies which use fundamental methods of short-term financial planning have better financial results than companies that use simulation methods. R² between reflects the quality of the adjustment of regression and is sufficiently large (0,7220), thus the change in time averages for each method has a more significant effect on each variable than the time variations of these indicators relative to the average.

Fixed effects regression model

Fixed effects regression model is the same original regression model, rewritten in terms of deviations from time-averaged values of the variables. This model is convenient, because it allows to eliminate unobserved individual effects from the model. The model is estimated by ordinary least squares procedure (minimum sum of squares methodology).

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 15. Model proved to be statistically significant ($p < 0,01$) as well as all independent parameters ($p < 0,05$).

Table 15. Description of fixed effects regression results

Variables	Coefficients	
	Model of fixed effects regression	p-value ($P > t $)
(Constant)	1,17	0,000

Method	0,56	0,000
Size	0,224	0,01
Age	-0,17	0,005
NPM	1,14	0,000
Cgap	-0,24	0,000
Growth	-0,021	0,000
Comp	0,028	0,008
R ² within	0,714	
R ² overall	0,567	
Sig.	0,000	

Source: Created by author

Quality of the model is assessed using R² value. R² between reflects the quality of the adjustment of regression and is sufficiently large (0,782), thus the change in time averages for each method has a more significant effect on each variable than the time variations of these indicators relative to the average. It can be concluded that within the framework of our model, inter-individual differences are more significant than dynamic differences. This indicates the need of consideration of individual effects. Although these results is a good argument against using the model of random effects. However, this is only a hypothesis, which we still need to verify statistically.

The most important difference in first two models is that coefficient of variable Method in pooled regression model is negative on the contrary to positive coefficient in fixed effects regression model above. Also, coefficient of Age variable became negative, but it's effect on ROE is not so big, so we probably can ignore this change, but to be statistically right, we should test these differences.

As far as coefficient of the main variable is above 0, we can accept our null hypothesis and conclude that companies which use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

Random effects regression

Random effects regression model can be considered as a compromise between the pooled regression imposing a strong limitation on homogeneity on all coefficients of the regression equation, and the fixed effects regression, which allows each object of the sample to enter its constant and, thus, consider the existing in reality, but unobservable in theory heterogeneity.

In the model with random effects, individual heterogeneity is considered not in the equation itself, but in the covariance matrix, which has a block-diagonal form, since within each group the random effects correlate with each other. To estimate such a regression, a generalized least-squares (GLS) method should be used.

Having run the hierarchical multiple regression in Stata 13 we have received the results, summary of which are depicted in Table 16. Model proved to be statistically significant ($p < 0,01$) as well as all independent parameters ($p < 0,05$).

Table 16. Description of random effects regression results

Variables	Coefficients	
	Model of fixed effects regression	p-value ($P > t $)
(Constant)	1,14	0,000
Method	0,54	0,000
Size	0,324	0,00
Age	-0,144	0,005
NPM	1,21	0,008
Cgap	-0,21	0,000
Growth	-0,022	0,000
Comp	0,027	0,01
R ² within	0,682	
R ² overall	0,489	
Sig.	0,000	

Source: Created by author

To interpret this model, we shouldn't rely on R^2 , since in a regression estimated using GLS, it is no longer an adequate measure of the quality of the model fit. The importance of regression in general is evidenced by the high value of Wald's statistics, $\text{Wald chi}^2 = 443.12$. In comparison to fixed effects model, all coefficients changed insignificantly, while dynamics of below/above 0 remain the same.

As far as coefficient of the main variable is above 0, we can accept our null hypothesis and conclude that companies which use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

The choice of the most appropriate model

We evaluated three major regression models: pooled regression model, regression with fixed individual effects and regression with random individual effects. To choose a model that provides the most adequate results regarding our data, we should perform a pairwise comparison of the estimated models:

- a) To compare fixed effects regression with pooled regression, we should use Wald's test;
- b) To compare random effects regression with pooled regression, we should use Breusch–Pagan test;
- c) To compare fixed effects regression with random effects regression, we should use Hausman test.

The Wald's test tests the hypothesis that all individual effects are zero. To provide all tests we used Stata 13 software. As far as p-value is $< 0,01$, we should reject null hypothesis. Thus, fixed effects regression model is better suited for describing our data than pooled regression model.

Breusch–Pagan test is used to define the presence of a random individual effects. Our sample consists of 174 values; thus we can use Lagrange multiplier to test or hypothesis. As far as p-value is $< 0,01$, we should reject null hypothesis. Thus, random effects regression model is better suited for describing our data than pooled regression model.

Finally, Hausman test is used to decide which of two regression models: with random or fixed effects better suited for describing the sample. In general, random effects model occurs only in the case random effects are not correlated with regressors. Regarding the results of Hausman test (p-value is $< 0,01$), we should reject null hypothesis.

Results of all tests allow us to conclude that fixed effects regression model is better suited for describing our sample. Well, it was expected, because for our study were chosen concrete companies and the composition of the sample doesn't change within years.

As far as fixed effects regression model proved to be statistically significant with $p < 0,01$ as well as all independent parameters ($p < 0,05$), we can accept our null hypothesis and conclude that companies which use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods. Moreover, size of a company, net profit margin and level of competition showed positive coefficients, while age, level of cash gap and growth rate have negative coefficients. All seven parameters tend to explain 56,7% of the variance (R^2 overall), what is both seems realistic and showed that the regression model is relevant to explain the sample.

CONCLUSIONS AND IMPLICATIONS

4.1 Conclusions

The goal of this study is to define relationship between the use of different approaches of short-term financial planning and financial performance of Russian small and medium sized companies. The study attempted to identify contribution of specific forms and methods of financial planning to a firm's growth perspectives. In order to achieve the goal we studied several aspects of different short-term financial planning methods and their relationship with a firm's financial performance expressed by several financial factors which effect on a company's return on equity (ROE).

Usually, when the relationship between financial planning and financial performance of a company were tested empirically, results were showing that such characteristics of operational and financial excellence as financial planning method, size of the company, its age, net profit margin (NPM), longitude of cash gap, pace of growth and level of competition within the entire industry positively influence company's success in some cases as well as its internal accounting financial results, usually measured as return on equity (ROE).

As far as it is an empirical study, the sample of 174 Russian small and medium sized companies that have been working no less than 5 years was formed and analyzed. In the chapter above, the theoretical explanation of the chosen econometric model, research hypotheses and analysis of descriptive statistics are presented and discussed. Dependent variable was formed using core indicator of company financial performance, such return on equity (ROE). In order to check the hypotheses that were formulated based on theoretical background, the panel data on small- and medium size companies was collected. This data was processed and prepared for the further investigation. Regression analysis was applied in order to test the hypotheses. The results were obtained by supporting the following hypotheses:

- Use of simulation (modern) methods of short-term financial planning has a positive relation with company's financial performance;
- Companies that use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

The results of the regression analysis conducted for this research are answering the research question of the paper – what methods of short-term financial planning, fundamental methods or modern approaches provide conditions for better financial performance of Russian

small and medium sized companies? The answer is that modern methods of short-term financial planning in general has positive relation to performance of the company and in average provide better conditions for financial performance. Results of the empirical study lead us to conclusion that in average companies that use simulation methods of short-term financial planning have better financial results than companies that use fundamental methods.

SMEs that use up-to-date financial planning approaches show in average better financial performance and have wider growth opportunities as well as sustainable development.

While bulding regression models to test Russian SMEs researchers should be sure about statistical significance of key parameters. Based on the relevant sample of Russian SMEs the author tested the significance of financial and operational parameters that affects return on equity (ROE). Ten key parameters was used for regression model explaining profitability or success of SMEs: age of the company, it's size, growth rate, financial planning method, net profit margin, level of cash gap, level of competition, share of talents, share of innovations and ease of financing. From analysis of literature, we can conclude that these factors are the most relevant for analysis of ROE of SMEs. Based on our sample, three of them proved to be statistically insignificant: share of talents, share of innovations and ease of financiang, thus we can conclude these factors are not relevant for describing the variability of the sample of Russian SMEs.

Use of modern methods in a company's short-term planning enables management to provide decision at a qualitatively much higher level. Simulation methods could be used for large scale analysis and for analysis of many alternatives, therefore the quality of forecasts and managerial decision become well. Due to use of statistical methods, results of simulation are much more detailed and show greater accuracy of predictions. However, these methods are quite complicated to implement and require special knowledge and skills that often go beyond traditional requirements for accounting or planning.

Implementation of the new methodology as well as building of new processes and optimization of operations in a company is a thourny way. Results of every change are questionable and never expected even being well structured and planned. Nowadays businesses are targeted by fast-paced changes, growing competition and huge uncertainty. Dozens of factors affect a company and in our point of view, well established financial planning is a powerful managerial tool which helps to stabilize operations and survive. While providing this study the author is not pretending to be a prophet who gives a secret knowledge for business, but to

explicitly show them intrinsic value of modern methods of financial planning and put on the table the idea of change.

4.2 Theoretical contribution and managerial implications

This research has contributed to several theories and, first and foremost, it has extended the understanding of the value of short-term financial planning and its role in a company's financial performance. It is important to mention that there are no studies in Russian scientific society which could be clearly dedicated to topic of financial planning for SMEs. While some researchers pay a portion of attention to industry leaders, in general the topic of SMEs financial planning is ignored. The author believes, that well established financial planning process plays on of the leading roles in a company's success. Effective planning commits the company to constant development together with operational excellence which in most cases resulted in financial success; thus, effective financial planning is fundamental stone in a wall of success of the company.

Theoretical contribution of this study is extended with the creation of statistically significant model that can be used in analysis of a company's success, which have not been investigated from the perspective of financial planning's contribution to the success of a company. The author believes that proposed specification of regression model as well as results expanded an understanding of factors affecting financial performance of Russian SMEs. Finally, this study could be considered as one of the first attempts to study the linkage between the performance of SMEs and financial planning approaches used for short-term planning.

With regard to managerial implications of the research conducted, it is worth to mention that it could be useful for companies' shareholders, CEOs and other parties (if exist) that are participating in strategic decision-making processes to understand the real value of financial planning and pay more attention to this ambiguous topic. During the interviews the author revealed the opposite view on short-term financial planning. While some top-managers believe that financial planning is the key to effective operations, others don't even imagine that short-term planning is more important than base supporting function in their companies. Since the majority of SMEs has a lot of barriers and limitations for growth, the problem of effective distribution of these resources is acute. Therefore, use of the most effective planning instruments as well as modern methods of planning can support growth and strengthen positions of a company on the market.

4.3 Recommendation for future research and limitations

While discussing both theoretical and practical contributions of the research conducted, it is worth to mention that there are certain limitations of the study, that were unavoidable during the process of conducting the empirical research.

Firstly, the limitation might be presented with design of the study, as the innovative performance outcomes might not be able to transform into financial ones immediately. Thus, introduction of 5+ years longitude research might eliminate this limitation, as it can capture the time-lagged nature of this translation.

Secondly, the generalizability of the results is under question. The results cannot be generalized to all the emerging markets due to the specific features of the environment of Russian Federation. Several financial non-financial parameters, such as the level of innovations, the number of talents in the company and ease of financing proved to be statistically insignificant being tested on the sample of Russian SMEs. On the contrary, studies based on samples of SMEs from other countries (both developed and developing) showed statistical significance of these factors. The author concludes that the reasons of such a difference could be described by the structure of sample as well as specific features of Russian SMEs and Russian business environment, which in general effect on managerial decisions and financial results.

Thirdly, due to academic reasons this research is limited, thus we should account for some specific limitations of this analysis. To start out, we should mention limitation of time and the size of the sample. Academic schedule affected the research in terms of limited time for data collection and research execution. Limited time lead to limited number of respondents, shortened amount of observed companies and short duration of qualitative study. Strict deadlines limited our possibilities to collect and observe more data and if there was not so short time for research, we could even extend the scope of our study and analyze more industries and reveal regional specifics and season dynamics.

Finally, regarding the specifics of survey, some factors were estimated by companies and cannot be measured by the author to prove their validity and objectivity. For factors, such as number of talents, level of competition and ease of financing, which were estimated judgmentally, we should be accurate in conclusions. The author proposes to provide deep analysis of effects of these factors on financial performance of companies in future, but in terms of current study this analysis is out of scope. The author has an optimistic view on results of the study, which supported by high R-squared of final model, however, the set of financial and non-

financial parameters that were chosen for this study could be developed. The author has a belief that out of dozens of criteria, there are several factors of success which should be tested to develop the model and expand our understanding of grass roots of success of SMEs.

Despite the limitations described above, empirical results are not compromised and can be used in order to further investigate the discovered phenomenon. All in all, future research may confirm the results of this study on the other emerging markets and compare them to those of Russia.

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Appendix 1. Survey

Respondent's profile:	Please fill in or select appropriate response
1. Your position	
2. Management level	
3. Years on a position	

Company's profile:	Please fill in or select appropriate response
4. Industry	
5. Size of a company	
6. Age of a company	

Methods of Financial planning:	Please fill in or select appropriate response
7. Please specify which method of financial planning is mainly used in your company	
Method of economic analysis	Multivariate (scenarios) method
Regulatory method	Method of economic and mathematical modeling
Balance method	Simulation methods

Financial performance:	Please fill in or select appropriate response
8. Return on equity (ROE)	
9. Cash gap in days	
10. Net Profit Margin	
11. Sales growth	
12. Market share	
13. Share of innovations in revenue	
14. Number of talents*	
15. Level of competition**	
16. Ease of financing***	

* Number of talents is amount of people engaged in R&D and innovation creating activities, such as key technicians, R&D specialists, data scientists, etc.

** Level of competition is numeric estimation from 1 to 5, where 5 is the strongest competition in industry (a lot of players with different market shares, no monopolists, several companies compete for leadership); 1 – is low level of competition, where market is monopolistic or there are no significant barriers to enter.

*** Ease of financing is numeric estimation from 1 to 5, where 5 is financing only with shareholders cash and price for money is high; 1- is ability to gain financing from several sources any time a year.