



The impact of macroeconomic factors on the analysis and forecast of the company's cash flows in Russia market

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Abstract

This study discusses prediction of the future cash flows of company using knowledge about macroeconomic and microeconomic factors and showing the importance of such factors. In order to achieve this goal, the following tasks were set in the work: 1. to understand concept of cash flows and the macroeconomic factors that can influence them. 2. To form, using a practical example, the forecast of the organization of cash flows of an enterprise, using methods of forecasting cash flows on the basis of the company's balance sheet and income statement for 2014-2021. 3. Make a conclusion on results of analysis and justify the importance of chosen factors. Scientific and methodological basis of research served the work of Russian and foreign scientists and specialists in financial management and financial forecasting. The information base of the conducted research was the data of the Russian and world fuel and energy statistics, materials of the global Internet; data of Rosneft oil company and different articles and handbooks. The work consists of 3 parts. The first part is devoted to the theoretical aspects of methods for predicting the cash flows of the enterprise.

The second part shows the application of the identified methods on the example of the oil and gas company “Rosneft”. The 3rd part summarizes the results of analysis of “Rosneft”.

Key words: cash flow, growth rate, inflation, regression analysis, macroeconomic factors.

Introduction

Planning and financial management covers the entire network device of the company. Every day, the financial manager has to predict the future cash flow structure on basis of the structure of current cash flows. In today's dynamic economic conditions, the primary task of financial managers is to prepare a cash flow forecast for an enterprise, both in the short and long term. It allows you to evaluate the liquidity of the company, plan future income and expenses and take timely action to prevent any problems with the finances of the corporation. Also forecasting the company's cash flow helps investors make investment decisions, since knowing the future cash flows, it is possible to evaluate the most secure company in terms of saving finances.

Lately abroad, more and more economists are paying attention to forecasting the cash flows of an enterprise. This is mainly due to the fact that some large companies carried out frauds with financial statements, disguising what they wanted, while deceiving their shareholders, such as the well-known scandal associated with Enron bankruptcy in 2001.

However, in Russia this subject has received little attention so far. This is due to two reasons. First, forecasting is still associated by many with the planned economy that has dominated over the years. Secondly, not everyone is aware of the fact that over the past 20 years - thanks to the advent of high-speed computers and the creation of modern statistical packages - there has been a real revolution in the use of business forecasting methods and specifically cash flow forecasting.

Therefore, the percentage of enterprises using cash flow forecasting methods is small, which, of course, affects the quality of the organization's work in the financial sphere and can lead to losses and lower profitability of the enterprise.

Thus, the need for forecasting cash flows as an element of the financial development of an organization in the current market conditions determined the relevance of the work.

A vital input for evaluation processes is a forecast of economic indicators. GDP growth, unemployment rates and interest rates are indicators of the overall health of the economy and are therefore important for future cash flow forecasts.

Research problem: The main problem in financial analysis is one of the important methods on which the evaluation of the financial performance of the economic units depends, and then addresses the shortcomings that appear as a result of this evaluation. On the accrual basis, and as a result, some of these financial ratios, such as the liquidity ratio, may not be achieved in the foreseeable future, so the adoption of financial ratios based on the cash basis provides financial information based on actual amounts that have been achieved in the period, which reduces the state of uncertainty, and the research problem can be summarized by asking The following:

(Is evaluating the financial performance of Russian companies under the list of cash flows more beneficial than under the lists of income and financial position?).

Research importance: The importance of the research is highlighted by the following:

- The importance of the informational content of the statement of cash flows in providing a clear vision for the beneficiaries of the cash flows of the operating, investment and financing activities of the company during the period of preparing the financial statements.
- The importance of evaluating the performance of economic units based on financial information that honestly and fairly represents the financial operations of these units.
- The importance of the financial performance of economic units in achieving their short and long-term goals and achieving their continuity and sustainability.

Research objectives:

- Highlighting the importance of the cash flow list for the beneficiaries, and the importance of adopting its data in analyzing the financial performance of the economic units.
- Analyzing the informational content of the cash flow list and its contribution to providing a clear vision for the beneficiaries about the performance of the economic units.
- Evaluate the financial information resulting from the financial analysis based on the statement of cash flows.

Concept and essence of cash flows.

Essential for efficient financial management in the enterprise is the organization of cash flows which considers the external conditions and features of its economic activity. Thus, one of the most important managerial tasks facing the management of the enterprise is the organization of the movement of monetary and material flows. On the one hand, it is necessary to ensure the maximum flow of funds in a unit of time, on the other - the most efficient use of available funds. In modern conditions, with a high level of inflation, delays in the flow of funds lead to their rapid depreciation, and irrational use leads to a drop in the company's profitability. (Buiter & Panigirtzoglou, 2003, 735)

In order to choose the best form of cash flow management and form a system of accounting and analytical support, it is necessary to consider in detail the factors affecting their volume, intensity and nature of formation over time.

The cash flow of the enterprise is a set of income and payments distributed in time generated by its business activities. (Prodchenko, 2066, p.30)

Macroeconomic factors influencing analysis and forecast of company's cash flows.

The macroeconomic group includes factors affecting the cash flows of enterprises within the national economy. These should include: (De Angelo & Masulis, 1980, p 23)

- GDP Growth rate;
- purchasing power of the population;
- entrepreneurial activity;
- inflation rate;
- Exchange rate;
- the state of the commodity market conjuncture;

Etc.

All factors included in the above group are undoubtedly important and should be constantly monitored and evaluated. Timely identification of existing trends in their change

can allow the company to avoid irrational costs and more accurately estimate the income, cash outflows and inflows.

Consideration of the influence of these factors follows both current and strategic cash management. Consequently, the basis of accounting and analytical support for managing cash flows with information on the impact of the above factors will be data of a strategic cash flow accounting system. (Fama & French, 2002, p 25)

Microeconomic factors

In the system of internal factors, the main role is played by the following:

Enterprise life cycle. At various stages of this life cycle, not only different volumes of cash flows are formed, but also their types (according to the structure of the sources of the formation of a positive cash flow and the directions for using a negative cash flow). The nature of the progressive development of the enterprise by stages of the life cycle plays an important role in predicting the volume and types of its cash flows.

The duration of the operating cycle. The shorter the duration of this cycle, the more turnovers are made by the funds invested in current assets, and, accordingly, the greater the volume and the higher the intensity of both positive and negative cash flows of the enterprise. An increase in the volume of cash flows while accelerating the operating cycle not only does not lead to an increase in the need for funds invested in current assets, but even reduces the size of this need. (Goodfriend, 2000, p 1023)

Seasonality of production and sale of products. According to the sources of its occurrence (seasonal conditions of production, seasonal characteristics of demand), this factor could be classified as external, but technological progress allows the enterprise to have a direct impact on the intensity of its manifestation. This factor has a significant impact on the formation of cash flows of the enterprise in time, determining the liquidity of these flows in the context of individual time intervals. In addition, this factor must be taken into account in the process of managing the efficiency of using temporarily free cash balances caused by the negative correlation of positive and negative cash flows over time. (Grossman & and Shiller 1981, p 225)

The urgency of investment programs. The degree of this urgency creates the need for the volume of the corresponding negative cash flow, while simultaneously increasing the need

for the formation of a positive cash flow. This factor has a significant impact not only on the volume of cash flows of the enterprise, but also on the nature of their flow over time.

Depreciation policy of the enterprise. The methods of depreciation of fixed assets chosen by the enterprise, as well as the depreciation periods for intangible assets, create a different intensity of depreciation flows that are not directly serviced by cash. This gives rise to the illusory point of view that depreciation flows have nothing to do with cash flows. At the same time, depreciation flows - their volume and intensity - being an independent element in the formation of product prices, have a significant impact on the volume of positive cash flow of the enterprise as part of its main component - cash receipts from product sales. The influence of the depreciation policy of the enterprise is manifested in the features of the formation of its net cash flow. When implementing accelerated depreciation of assets in the net cash flow, the share of depreciation deductions increases and, accordingly, the share of the company's net profit decreases (but not in direct proportion due to the effect of the "tax shield"). (Metel'skaya, 2018, p 2215)

Operating leverage ratio. This indicator has a significant impact on the proportions of the rate of change in the volume of net cash flow and the volume of sales.

Methods of Forecast Company's cash flows.

Control of the inflow and outflow of funds is carried out by careful and accurate reflection of their appearance and their movement. Methods of predictions include the following procedures. (Myers, 2003, p 238)

1. Forecasting cash inflows for certain periods of time;
2. Forecasting cash outflows for certain time intervals
3. Calculation of net cash flow;
4. Finding the necessary funding requirements.

To date, a great many methods and models of economic forecasting have been created and continue to be created; therefore, focus is on the main ones that would be the most optimal for use in the enterprise. (Jackson, 2015)

1. Weighted average method

The method is based on determining the forecast data using arithmetic average weighted for data preceding periods. In this case, the periods of more than similar to the predicted and the same periods of time of past years (taking into account seasonality) to calculate this forecast, you need to know the actual indicators for the last several periods. For those periods that the values farthest from the projected are assigned the smallest weights. After this is the sum of all values projected figure for periods and divided by the amount of weights. (Navalkha, 1997, p 370)

2. Coefficient method

This method is widely used in the practice of large public companies of Western countries, with the publication of statements of enterprises. It lies in the fact that the current value of the indicators is multiplied by coefficient calculated in advance. To calculate the desired ratio and build a forecast requires values of intermediate indicators such as turnover ratios that allow in further predict future receivables and payables debt.

3. Extrapolation method

This method is based on identifying future trends and trends, on based on observed trends in the past. For extrapolation the following assumptions are characteristic: the development of a phenomenon may be characterized by the trend and the general conditions that determine the trend are not will undergo significant changes in the future.

Often simple extrapolations are used as single-factor functions where the predicted value depends on single factor trait. For the economic and scientific-technical forecasting characterized by the use of one main factor-argument - time.

It is known that the value of the predicted index does not affect only time, but many other factors, but they also change in the time.

One of the simplest methods of economic forecasting is to identify the trend and its extrapolation. This trend describes the process of changing the studied quantity for a certain period of time and excludes seasonal fluctuations.

4. Moving average method

One way to calculate cash flow is the method moving average. The basis for the calculation and interpretation of moving averages the definition of the moving average itself

is taken as the average cost of a product over a certain period. The calculation period it is selected on the discretion of the analyst.

The moving average is used to observe price spikes on raw materials. Investors quickly buy securities, if they in price they rise above the average and sell, if vice versa.

Dignity of such a system using a moving average it allows you to play in the direction of the current financial position of organizations.(Hackbarth, 2008, p 870)

5. Exponential Smoothing Method

This method is based on the weighted average method and moving average. From the weighted average, he took the weight, and from the moving average - smoothing the values so that in the forecast period there is no emissions. It can be used both to build short-term forecasts, and to build long-term predictions of magnitude. And may be worked out to automatism in order to correct the forecast obtained.

This method considers all previous actual data - the previous is considered with a large weight, preceding it - with less, the earliest observation affects the result with a smaller statistical weight.

6. Method for constructing a multiple regression model

The standard regression type is the function where the dependent variable is influenced by various factors.

$$Y = f(X_1, X_2, \dots, X_M; \beta) + \varepsilon,$$

Where:

Y is an endogenous variable;

f - functional relationship;

M is the number of exogenous variables;

X_j - jth exogenous variable, $j = 1, M$;

β is the vector of unknown parameters;

ε is a random variable.

To check the constructed regression, the coefficient of determination is used, which characterizes the degree of connection between the dependent variable and the factors affecting it. Depending on the values of this indicator, it is possible to estimate the strength of the association of factors with the dependent variable.

Analysis of cash flows of “Rosneft”

Rosneft is the leader of the Russian oil industry and the largest public oil and gas corporation in the world. The main activities of “Rosneft” are the search and exploration of hydrocarbon deposits, the extraction of oil, gas, gas condensate, the implementation of projects on the development of offshore fields, the processing of extracted raw materials, the sale of oil, gas and their products in Russia and abroad.

“Rosneft” for the entire period is in absolute financial stability. This type is characterized by the fact that all the stocks of an enterprise are covered by its own working capital, that is, the organization does not depend on external creditors, the lack of non-payment and the reasons for them occurrence, the absence of violations of internal and external financial discipline, and which is caused by an increase in receivables and a decrease in accounts payable.

Analysis of cash flow shows that Rosneft has a payment surplus for the core business. The amount of net cash flow from operating activities is greater than zero. This is due to the growth of rental and license payments, as well as royalties and other income, which is a positive trend in the development of the enterprise. For investment activities in the analyzed periods, there is a payment deficiency - outflow prevails over the inflow. Net cash flow from investing activities is negative.

The situation is not prosperous and indicates a low investment activity in Rosneft.

An analysis also showed that Rosneft has enough own funds (net profit and depreciation charges) for investment activity and therefore, it does not acquire bank loans for these purposes.

Analysis and forecast of cash flows of “Rosneft”

Macroeconomic factors

Firstly, it is necessary to identify the macroeconomic factors that mostly influence cash flows of the company. It can be done through building a regression model. In the following calculations the next indicators are taken: growth rate of Russian economy, dynamics of prices on oil, exchange rate, and inflation. The reason for taking exactly these indicators is that they were on the whole the most impactful for “Rosneft” for the past few years. This conclusion was given by them in their report.

Table 1. GDP growth (%) from 2014 to 2021.

2014	2015	2016	2017	2018	2019	2020	2021
100,7	97,7	100,3	101,6	102,3	101,3	97	104,6

Source: Prepared by the authors (2022)

Table 2. Prices on oil (in rubles) for each year since 2014 till 2021.

2014	2015	2016	2017	2018	2019	2020	2021
77,5	46,4	51,26	63,07	69,21	63,7	43,3	104,84

Source: Prepared by the authors (2022)

Table 3. Exchange rate USD/RUB.

2014	2015	2016	2017	2018	2019	2020	2021
34,8887	52,8213	65,9962	56,6876	62,0188	63,7362	71,1464	73,65

Source: Prepared by the authors (2022)

Table 4. Dynamics of inflation rate in Russia.

2014	2015	2016	2017	2018	2019	2020	2021
11,4%	12,9%	5,4%	2,5%	4,3%	3%	4,9%	8,4%

Source: Prepared by the authors (2022)

Basing on these indicators, the regression analysis can be performed to reveal the significance of these indicators for changes in cash flows of company.

Table 5. Regression analysis. (Sett & Sarkhel, 2010, p 47)

The output									
The regression of statistic									
Multiple	0.996								
R-nvadrate	0.993								
Norma	0.981								
Standard	3535								
Observatio n	7								
Analysis of variance									
	OF	SS	MS	F	Significance F				
Regression	4	3.925	9.813 7	78.5 27	0.012 6				
Remains	2	2.499	1.249 7						
Total	6	3.950							
coefficient		standar d	statist ic	valu e	Lowe r 95%	Up per 95 %	Low er 95%	Upp er 95%	

Intersection	-3.63	2.009	- 1.809	0.21 2	- 1.227	5.0 08	- 1.22 7	5.00 8	
Variable	4774 1	3723	12.82 0	0.00 50	3171 9	63 76 3	317 19	637 63	Exc han g rate
Variable	7.074	9.166	7.717 7	0.01 63	3.130 4	1.1 01	3.13 04	1.10 18	Infl atio n
Variable	1848 1	2441	7.569	0.01 70	7975 8	28 98 7	797 58	289 87	Pric e
Variable	-7673	2.056	- 0.037	0.97 3	- 8.923	8.7 70	- 8.92 3	8.77 02	Gro wth rate

Source: Prepared by the authors (2022)

As it is clear from the results of regression analysis (particularly, from P-value), all variables except growth rate (as its P-value is much higher than significance level) are significant for forecasting cash flows of company.

The value of the multiple coefficient of determination R^2 shows that 99% of the total variation of the resultant attribute is explained by the variation of the factors— the logarithm of the price of oil and exchange rate and the logarithm of the of inflation rate. Thus, the selected factors significantly affect the cash flows of enterprise, which confirms the correctness of their inclusion in the constructed model. Consequently, the growth rate can be eliminated from regression analysis. (Woodford, 2010, p 37)

Table 6. Regression analysis without growth rate.

The output							
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The regression of statistic									
Multiple	0.996								
R-nvadrated	0.993								
Normal	0.987								
Standard	2887								
Observation	7								
Analysis of variance									
	OF	SS	MS	F	Significance F				
Regression	4	3.925	1.3085	156.945	0.0008				
Residuals	2	2.501	8.3372						
Total	6	3.950							
The coefficient		standard	statistic	value	Lower 95%	Upper 95%	Lower 95%	Upper 95%	
Intercept	-	3.057	-	0.001	-	-	-	-	

ion	3.7 08	1	12.13 1	2	4.68 1	2.73 5	4.68 1	2.73 5	
Variable	4.7 7	2989 33	15.96 20	0.000 5	382 02	257 22	382 02	257 22	Excha nge rate
Variable	7.0 9	6.577 1	10.78 12	0.001 7	4.99 77	9.18 40	4.99 77	9.18 40	Inflati on
Variable	1.8 4	1640 12	11.23 68	0.001 5	132 00	236 49	132 10	- 2.73 5	Price on all

Source: Prepared by the authors (2022)

Coefficients in Table 5 can be used to identify a regression equation:

Net Cash Flow= (4, 77 E+10) *Exchange rate+ (7, 09E+12) *Inflation Rate+(1,84E+10) *Price on oil-(3,70883E+12)

Next, the forecast of future cash flow of company can be performed.

After building the regression model, the problem appears in forecasting, which boils down to solving this equation with known values of factors. Since if there is the prediction of the future, the factors influencing the dependent variable are also unknown, then the values predicted by analysts are taken. (Volkov & Nikulin, 2012, p 18)

Table 7. Predicted values of macroeconomic factors. (Aqbal & Kume, 2014, p 265)

	Exchange rate (Predicted)	Inflation rate (Predicted)	Price on oil (Predicted)
2022	76,7 rub	6 %	\$106
2023	78,7 rub	4 %	\$97,24

Then, the substitution of unknown variables can be done and Net cash flow can be calculated:

$$\text{Net Cash Flow (2022)} = (4,77\text{E}+10) * 76,7 + (7,09\text{E}+12) * 6\% + (1,84\text{E}+10) * 106 - (3,70883\text{E}+12) = 2\,329\,994\,361\,510$$

$$\text{Net Cash Flow (2023)} = (4,77\text{E}+10) * 78,7 + (7,09\text{E}+12) * 4\% + (1,84\text{E}+10) * 97,24 - (3,70883\text{E}+12) = 2\,122\,162\,225\,589$$

Thus, Cash Flows of the company can be forecasted by using regression analysis. Moreover, identified indicators play huge role in forming cash flows that is proved by given calculations.

Thus, to describe cash flow forecasting methods reviewed in the first part of the work, using the example of Rosneft, forecasts of cash flow were made using the company's reporting data for the period 2014–2021. A regression model was proposed that the company's cash flows depend on the market prices for oil, exchange rate and inflation rate. Decisions made on the basis of data analysis of the method of constructing multiple regression are based on the comparison of significant variables in the regression and the result. During the application of this method, the dependence of cash flows on the price of gas and USD/RUB rate, as well as on the inflation was revealed. (Sarbpriya, 2012)

Impact of macroeconomic and microeconomic factors on cash flows of company.

From the given analysis of cash flows of Rosneft some conclusions about importance of macroeconomic factors can be made.

The assessment of Rosneft OJSC was made with using discounting cash flows, the company's most important factors were selected using regression model. The obtained values and analysis of the methods would be useful for investors who want to invest in this company. A model of company valuation was built, with application of the discounted cash flow method. (Uddin & Alam, 2007, 126)

Conclusions:

This study provides reasons for further study of the problem of forecasting the cash flows of the enterprise.

1. The leadership of any enterprise needs the skills to properly organize the movement of financial assets.
2. The organization of financial flows should contribute to the filling of enterprises with financial resources from various institutions of the financial sector of the economy.
3. One of the most important components for the organization of effective and profitable activity of the enterprise is cash flow and knowing most important macroeconomic factors is essential as they form cash flows and have a huge impact on operation of any company.
4. In the case of “Rosneft it is even more important as this is an oil company and in Russian conditions it is really dependent on macroeconomic situation as almost 50% of production in Russia is in oil and gas sector.
5. The needs to Proper organization of cash flows is necessary for the formation and profit of any enterprise.

Suggestions:

1. In order to raise research to a qualitatively new level of forecasting, it is necessary to create and research new methods or qualitatively improve existing ones.
2. Professional regulation and analysis of cash flows is an important factor and business management efficiency, and it is precisely the proper organization of cash flows that allows you to avoid most financial markets and ensure a stable profit.
3. In the market conditions, effective cash flow management, as well as their forecasting, become the most urgent tasks for enterprise management, since the solution of these tasks focuses on the main ways of obtaining positive financial results.

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