

## Strategy of M&A deals in oil industry (on example of «Rosneft» and «Bashneft» deal)

*K.L. Astapov*

Moscow School of Economics, Lomonosov Moscow State University,  
1-61 Leninskie Gory, Moscow 119991, Russia

**Abstract.** I analyzed merges and acquisitions' transactions and their influence on strategy and development of oil company. For analyses the deal I chose acquisition by Rosneft of Bashneft, which took place in October 2016, applying both traditional and real option models. Real option model is more difficult, but better methodology, because it allows to value different scenarios of acquisition, choose more optimal scheme (acquisition time, amount of acquired shares). After building decision tree I calculated NPV of cash flows, which are generated in the deal (in scenarios of high and low oil prices, high and low synergy effects in two periods 2017–2018 and 2019–2020). The main results are the following. Acquisition deals create value for shareholders, only if acquisitions correspond to strategy of bidder company and culture of target company. Under some hypotheses the acquisition of Bashneft creates additional value for Rosneft in most scenarios (except scenario with low oil price and low synergy). Postponing the decision about complete acquisition till 2019 increases probability of successful acquisition as well as maximizes NPV.

**Keywords:** strategy, merges and acquisition, oil industry, valuation, option model

**For citation:** Astapov K.L. Strategy of M&A deals in oil industry (on example of «Rosneft» and «Bashneft» deal). *Ekonomika v promyshlennosti = Russian Journal of Industrial Economics*. 2020. Vol. 13. No. 2. Pp. 137–148. (In Russ.). DOI: 10.17073/2072-1633-2020-2-137-148

## Стратегия сделок слияний и поглощений в нефтяном комплексе (на примере сделки «Роснефти» с «Башнефтью»)

*К.Л. Астапов*

Московской государственной университет имени М.В. Ломоносова,  
Московская школа экономики, 119991, Москва, Ленинские горы, д. 1, стр. 61

**Аннотация.** Целью данной статьи является выявление роли слияний и поглощений, в стратегии компаний, определение наиболее эффективных методик оценки эффективности преобразований.

Учитывая, что ни в науке, ни среди практиков нет единой методологии оценки процессов слияний и поглощений, данная работа представляет актуальность как в практическом, так и в теоретическом плане. Нередко слияния и поглощения разрушают акционерную стоимость компаний. Именно стратегии создание стоимости – один из приоритетов данной статьи.

В статье обосновывается, что вектор сделок слияний и поглощений задается стратегией компании и должен соответствовать ее стратегическим приоритетам.

Основной вывод автора заключается в том, что при оценке сделок слияний и поглощений, надо ориентироваться не только на финансовые показатели, но и на соответствие стратегий двух компаний. При этом для оценки трансформаций необходимо использовать более сложные модели, учитывающие различные сценарии, в том числе модель опционов.

В данной работе продемонстрировано, что сделка приобретения компанией «Роснефти» компании «Башнефти» явилась стратегически обоснованной. Проведенный анализ сделки, включающий изучение финансовой отчетности, построение сценариев и дерева решений, применение теории опционов на практике, продемонстрировал, что «Роснефть» выбрала наиболее эффективную стратегию. Разделение решений о приобретении полного пакета компании «Башнефти» было верным шагом для создания стоимости для акционеров.

**Ключевые слова:** стратегия, слияния и поглощений, нефтяная промышленность, оценка бизнеса, модель опционов

## 石油综合体中的并购战略 (以俄罗斯国家石油公司收购巴什石油公司的交易为例)

K.L. 阿斯塔波夫

莫斯科罗蒙诺索夫国立大学，经济学院，经济与金融战略系，  
119991, 莫斯科，列宁山1号，61号楼

简评：本文的目的是揭示合并和收购在公司战略中的作用，确定评估重组有效性的最佳方法。考虑到在科学界和从业者中，没有一种方法可以评估并购过程，因此这项工作无论在实践上还是在理论上都有现实意义。并购通常会破坏公司的股东价值。正是创造价值的战略是本文的重点之一。事实证明，并购的方向和力度是由公司的战略决定的，必须符合其战略重点。作者的主要结论是，在评估并购时，不仅应关注财务指标，还应关注两家公司战略的匹配性。此外，要评估重组，必须使用考虑到各种方案的更复杂的模型，包括期权模型。事实证明，俄罗斯石油公司收购巴什石油公司的交易在战略上是合理的。对交易进行的分析，包括研究财务报表，构建方案和决策树，以及在实践中应用期权理论，表明俄罗斯国家石油公司选择了最有效的战略。获得巴什石油公司的全部股份的决策是为股东创造价值的正确步骤。

关键词：战略，兼并和收购，石油工业，商业估值，期权模型

### Introduction

Merges and acquisitions is a trend for economies, where big transnational corporations prevail. Strategies of big corporations are rarely limited to organic growth, but substantial resources give them opportunity to set ambitious goals and expand fast, for example entering new geographical market or developing new products and technologies or getting new licenses for natural resources extraction. But development of new technologies might require a few years. In general the scenario of rapid growth based on internal resources is quite difficult and require much time. Alternatively, strategies of mergers and acquisitions are the fastest way to reach strategic goal, but the cost of these strategies might be very high.

The company's capitalization is the main, but not the only, parameter to be focused on during

M&A. We should take into account interests of shareholders, as well as other stakeholders: employees of the company, its partners and clients, the population living in the company's area of operation, regional and federal authorities. For example, in some cases it is more profitable to close divisions in certain regions and move production to other regions or countries. Such a strategy may well serve the interests of shareholders in the medium term, while management, employees, and local authorities may be interested in maintaining production. Multi-criteria and often conflicting interests of different groups make it difficult to evaluate mergers and acquisitions.

We do believe, that option theory gives more possibilities to evaluate the deal, consider different scenarios, including interests of other stakeholders. Some scenarios might have negative NPV, but if we take into account wider

prospective and demonstrate strategic thinking, then the realization of project, including merger and acquisition deal, might be considered as essential for the company's development in the long run. In my further analyses I compared different methodologies of valuation M&A deal, applying them recent deal in Russian oil industry («Rosneft» and «Bashneft» deal in the end of 2016).

### Traditional valuation

As mentioned in Introduction, traditional purpose of financial strategy is to maximize capitalization [1].

Usually criteria for merges and acquisitions of two companies A and B is that the value of new united company  $V_{AB}$  is more than  $V_A + V_B$ . Let us define synergy  $S$  as a difference:  $S = V_{AB} - (V_A + V_B)$ . Synergy is a different from goodwill, because main purpose of goodwill is to incorporate new assets in financial statement of bidder company, whenever synergy is economic effect, which is based on economic factors of merges and acquisitions.

Synergy indicates, that for both companies are creation of value are expected. The main reasons for M&A are following: increasing product range, supporting distributional channels and entrance to new geographical markets, increasing manufacturing capabilities and gaining new competences, overcoming state restrictions (bidder company acquires company,

which owns some licenses), reducing cost due to optimization of work of two enterprises, supporting pricing power and market share. Actually, many transactions do not create any value to shareholders in case they do not correspond to the strategy of the bidder company.

So, when transaction are support main business of bidder company, corresponds to its strategy, these deals have higher probability to be more successful. I could propose the following scheme Fig. 1 for analyses, which combines traditional approach, developed by Robert Gram [2], Donald Hambrick [3] and Vladimir Kvint [4].

If company A (bidder company) acquires company B (target company), then it means that company A pays to shareholders of company B either money (denote this amount of payment as  $P$ ) or shares of company A or the combination of the above.

$P$  certainly more than  $V_B$  otherwise there is no sense for shareholders of company B to sell their shares for less than they can get now on financial market (we assume that financial markets are efficient and market valuation of company B is fair, the company is not under or overvalued). In that case synergy  $S$  is divided between shareholders of companies A and B. So:  $V_B \leq P \leq V_B + S$ . The reasons for synergy  $S$  are different and depend on, which kind of merger do we have, vertical or horizontal.

In our case of acquisition of Rosneft and Bashneft in October 2016 we should consider

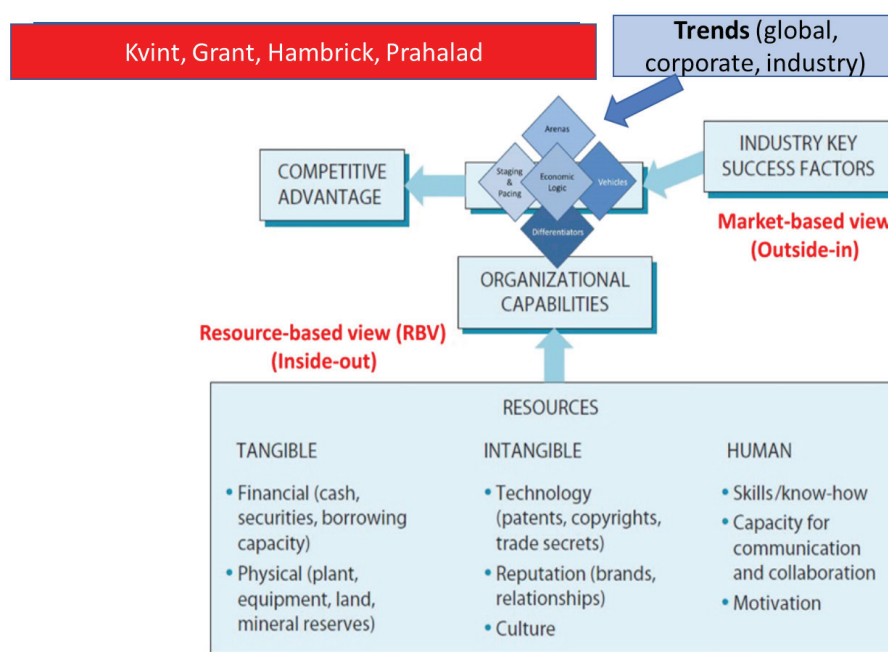


Fig. 1. Developing strategy based on Resource-based and Market-based views

the following. These companies in one industry of oil and gas extraction, petroleum production etc., though their strategies might be different: Bashneft mostly worked in Bashkortostan, but had petroleum station in different regions. Rosneft is a national company. Horizontal merger could give a good synergy effect, because companies were expected to decrease their administrative expenses, more efficiently allocate resources (sharing petroleum stations, optimizing productivity of Bashneft's oil refinery factory in Bashkortostan, share technology, integrate oil exploration etc). On the other side, Bashneft is formally an independent company, its shares are still traded on Moscow Exchange, though Rosneft owns over a half of Bashneft's shares.

Merges and acquisitions are considered as an important strategic decision, which could substantially influence the future of both companies. Traditional methodology of pre-acquisition valuation of company B might be based on DCF analyses, market (or industry) multiples, premiums paid in previous transactions (multiples method) [5]. But all these methods have some limitations. For example, when we use DCF, we usually consider two times horizons: for first we calculate NPV for limited amount of years (usually up to 5–7 years), then we calculate so called "terminal (continuing) value", which might be very sensitive to discount rate. Market multiples, especially using average multiples for industry, are not very efficient, because finding a comparable public company is not always possible. Furthermore, synergy effect is very individual in every transaction. The same is fair for comparable transactions that already have taken place in the past (not only transactions are different, but also market conditions changed) [6].

During M&A is it important to consider all factors and consider the deal, taking into account both financial and strategic issues, and the deal should be considered by both CEO (positive and optimistic view for perspective) and CFO (deep analyses) [7].

Rosneft suggested price 3706 RUB per share, whenever the average price of Bashneft for the previous 6 months before the deal was 2989 RUB

(about 3300 RUB in October 2016). For 50,07–55 % of Bashneft Rosneft totally paid by cash 329.69 billion RUB. So  $P = 330$  billion RUB<sup>1</sup> [8].

In order to estimate  $V_B$  I used market valuation of Bashneft. **Figure 2** demonstrates monthly market prices of Rosneft and Bashneft shares from 2014 till middle of 2018. Market values of ordinary shares of Rosneft and Bashneft shares were calculated by multiplying market value of only ordinary shares by issued amount, though correct calculation of capitalization of two companies required estimation market value of preferable shares and other instruments as well.

So  $V_B$  varied and we might calculate it, taking into consideration that market price of Bashneft share was 3333 RUB on November, 1 2016, or it was 2 989 RUB for the previous 6 months before the deal:  $442 \leq V_B \leq 493$  billion RUB. So market value of 50.0755 % of Bashneft's ordinary shares might be from 221 to 247 billion RUB. Actually, Rosneft paid  $P = 330$  billion RUB. So, it means that synergy effect should be at least not less than:  $S \geq P - V_B$ , which is 83–109 billion RUB.

Synergy effect  $S$  estimated differently. Executive director of Rosneft Mr. Igor Sechin announced at the Annual Shareholders Meeting, that Rosneft will work to maximize the synergetic effect. The powerful synergistic effect will be ensured by the optimization of reciprocal supplies of oil, transportation and logistics costs, reduced cost of drilling services, joint use of the infrastructure of production assets, modern technologies and know-how. The prompt monetization of this effect is guaranteed by Rosneft's successful experience in integrating TNK-BP. In the first two quarters of 2017, the synergetic effect of Bashneft's integration will reach over 40 billion RUB in cash. But later synergy effect was re-estimated for 2017 year as 45 billion RUB [9]. So, if we suppose that synergy (45 billion) would extend for four years (2017, 2018, 2019, 2020) and use discount rate 11 %<sup>2</sup>, then the total synergy would be 140 billion RUB in 2016.

According to estimate of Ministry of economic development of Russia, positive effect of the acquiring of state own shares of Bashneft was 150–180 billion RUB, due to economy of oil processing and extraction [10]. If synergy was realized during 4 years and we applied the same discount rate 11 %, we could estimate synergy per a year as 48–58 billion RUB.

UBS believed, that the synergy would be lower [11].

<sup>1</sup> Rosneft owned 102 432 459 shares from 147 846 489 (57,66 %) as it was on June 1, 2018.

<sup>2</sup> I use discount rate for Rosneft 11 %, which approximately corresponds to WACC for Rosneft. Until the beginning of 2018 year interest rates in Russian economy were declining and in 2018 rates started increasing because of inflation's growth. In 2019 rates begun declining again.



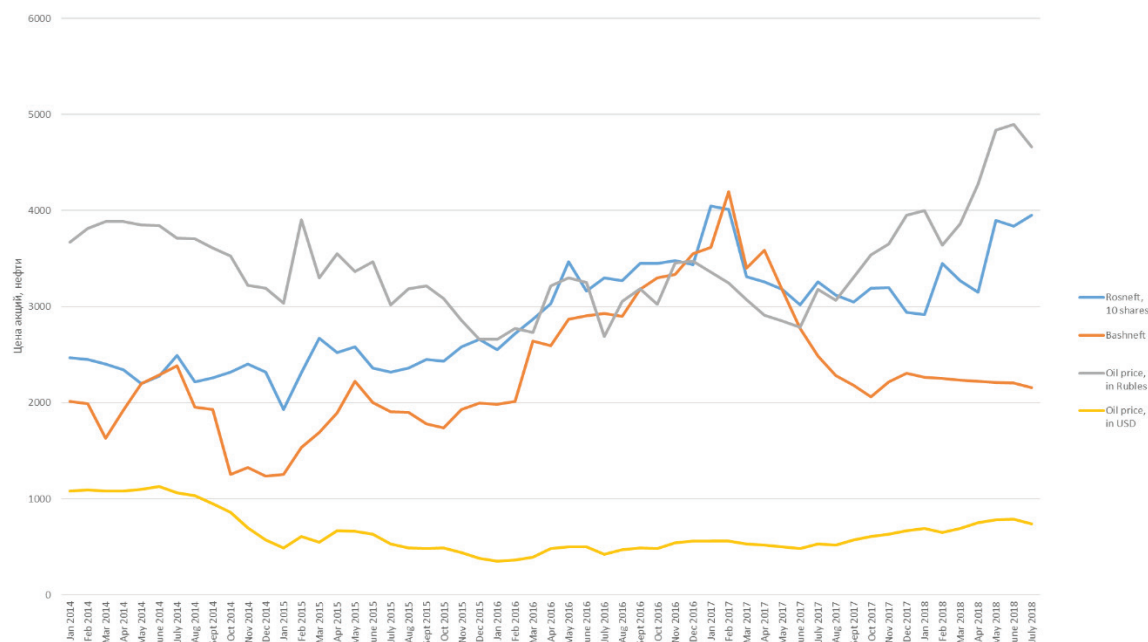


Fig. 2. Market prices for Rosneft and Bashneft shares from 2014 till middle of 2018

Coefficients of linear regression between companies' share and oil price					Table 1
	Period before the deal (January 2016 – November 2016)	Short time after the deal (November 2016 – February 2017)	In four months after the deal (February 2017 – June 2017)	After the deal – middle term (June 2017 – June 2018)	
	Oil price unstable, but growth	Slight increase of oil price, turning point	Falling of oil price	oil price growing	
Rosneft share	0,80	-2,80	1,89	0,32	
Bashneft share	1,03	-3,28	2,53	-0,14	

Taking into consideration, that revenue of Bashneft for 2016 was 593 billion RUB and synergy valued at from 45 billion RUB till 58 billion RUB (about 7.6–9.8 % of revenue), I suppose really strong efforts of two management teams were required to successfully implement integration of companies and to get necessary synergy. Potential for decreasing Rosneft's costs were not high due to different locations of companies.

Synergy effect at the level of 140 billion RUB was considered by me as optimistic scenario ( $S_H$ ), because in that case both Rosneft and Bashneft shareholders are interested in the deal, though more than a half of synergy would be received by Bashneft's shareholders.

If we consider Fig. 1, we could see, that before the deal and 2–3 months after it, prices for both Rosneft and Bashneft went up. Growth of share price of Bashneft was higher (coefficient of linear regression to oil price was 1.03, see in Table 1)

than Rosneft (0.80). We can conclude that market expectation of Bashneft's perspectives were positive and some rumors about the deal (which started in the middle of 2016) warmed price of Bashneft's shares.

After the deal despite some fall of oil price Bashneft's share fastened its growth (-3.28, negative sign meant, that share price and oil price went in different directions), as well as Rosneft (-2.8). We could say that this short period of time was "market euphoria". In February 2017 oil prices started falling and that negative trend continued till June 2017. Rosneft's share price started decline about twice faster then oil price (1.89), whenever Bashneft's share price were falling even faster (2.53). So market reconsidered the deal.

In June 2017 market trend changed and oil prices started to grow quite fast. Rosneft prices also grown up, but substantially slower (0.32). At the same time Bashneft's price felt

(-0.14, negative sign means that for 1% of oil price increase, Bashneft price was falling for 0.14 %). So from February 2017 we could clearly notice that market re-estimated Bashneft's acquisition. Tightening of sanctions, imposed by the USA and other countries, certainly negatively influenced market price of both companies. But strong negative dynamic of Bashneft's shares demonstrated, that either Bashneft was overvalued, or synergy was overestimated.

#### **Influence of Bashneft's acquisition on Rosneft's financial statements**

Rosneft financial statements already included (from November 2016) the appropriate part of financial assets, revenues and other financial flows of Bashneft (proportional to Rosneft's share). Bashneft's deal was one of many for Rosneft, so it is difficult to estimate how this deal influenced financial performance of Rosneft by analyzing consolidated financial statements in years 2017 (after the deal), 2016 (deal) and 2015 (before the deal).

From Profit or Loss Statement of Rosneft we could see, that structure of revenue and cost did not change substantially. Production and operation costs decreased from 11.3 % (where oil, gas and petroleum sales are 100 %) in 2015 and 11.4 % in 2016 to 10.3 % in 2017. We also could see some optimization in pipeline costs. Controversary, Rosneft increased most other costs, for example general and administrative expenses increased from 2.6% in 2015 to 2.9 % in 2017. So, synergy effect was not obvious from consolidated profit and loss statement [12–14].

On the other hand, we could see that revenue of both companies increased substantially from 2016 to 2017 in absolute amount. If we took 2015 as a base year, revenue of Rosneft increased for 15.9 % from 2015, and Bashneft – for 10 %, whereas average oil price drop for 1.3 %. So, the integration of two companies allowed to grow fast (especially for Rosneft).

From balance sheet we could see that current assets (liquidity) of Rosneft decreasing. Long-term assets were increasing, for example property, plant and equipment increased from 61.1 % (where 100 % – total assets) in 2015 to 64.3 % in 2016, which was also due to the deal. Goodwill did not change substantially, which might mean that Rosneft management believed, that there was not much premium paid for Bashneft.

Current liabilities increased substantially, especially loans and borrowings from financial

institutions (from 10.8 % in 2015, to 14.2 % in 2016 and 18.2 % in 2017).

On the other hand we could see fast decrease of long-term debt from 23.7 % in 2015 to 14.6 % as well as prepayments on long-term oil and petroleum agreements from 18.5 % to 10.8 % [12–15].

This change of financial structure as well as substitution of long-term debts in USD and EURO to short-term debt in RUB is mostly due to sanctions imposed by the USA and other countries. On the other hand, management of Rosneft could have increased middle-term debts in RUB, not short-term.

Analysis of Cash Flow of Rosneft also supports our conclusions. Net cash provided by current operation decreased substantially from 2258 billion RUB in 2015 to 391 billion RUB in 2017. This was substantially determined by dynamic of long-term prepayments made on oil and petroleum products supply agreements. High cash prepayments (938 billion RUB) in 2015 certainly followed cutting cash in 2016 and 2017.

In cash flow we also could see gain on out-of-court settlement (100 billion RUB), which was caused by court decision that Rosneft should receive from AFK System (former owner of Bashneft) the above amount (in profit it was in 2017, but cash payment would be in 2018) due Bashneft losses were partly caused by non-efficient AFK System execution etc. [16]

Cash used in investment activities increased from 813 billion RUB in 2015 to 1162 billion in 2017, which also supported that Rosneft tried to grow fast by increasing capital expenditure, not only by acquiring other companies.

Rosneft increased its borrowing very fast. In 2017 and 2016 the company attracted financing (cash) for 645 and 381 billion RUB accordingly, whenever in 2015 Rosneft repaid its debts for 1091 billion RUB. Also important that the structure of borrowings had changed – long term debts were repaying, and short-term – increasing.

In general, Rosneft had weak cash flow, because operating activities in 2017 generated only 391 billion RUB, whenever interest payments in 2017 were 219 billion RUB. This is caused by Rosneft's fast grow, in particular acquiring of Bashneft. Government and even a court decision (AFK System case) supported financial stability of Rosneft, but anyway the company needs to stop acquiring assets, more accurately finance its activities (stop substitution of long-term debt by short-term borrowings), try to grow organically.

### Real option model

Real option model is very efficient model in M&A. It gives agile approach for valuation, as well as decision making in M&A [17–20].

In real option model valuation is based on assumption that Rosneft had not to acquire all Bashneft's shares immediately in 2016. Rosneft had an opportunity to make two steps acquisition of Bashneft by acquiring 50.08 % in 2016 and considering opportunity to buy more 49.92 % shares in 2018 (or do not buy, depending on market situation in 2017). Traditional method does not give such flexibility and Rosneft either buy 100 % or 50 % shares of Bashneft in 2016.

So, when I valuate opportunities for acquisition of Bashneft (base year is 2016), we would consider different scenarios – with high and low oil prices, as well as high ( $S_H$ ) and low synergy effect ( $S_L$ ). I would prove further that if oil price is high in 2017–2018 and synergy is maximum, then Rosneft should invest more in Bashneft (otherwise – buy only 50.08 %).

Rosneft might take one of two decisions: first – buy 100 % of Bashneft shares in 2016 (this case is considered at the end); second – buy 50.08 % of Bashneft shares, wait and in 2018 either buy more 49.92 % Bashneft shares or do not buy (see decision tree in Fig. 3).

Oil price in 2017–2018 might be high with probability 50% or low with probability 50 %. For simplifying decision tree, I assumed that if oil price were high in 2017, it would be high in 2018 and afterwards.

Synergy might be either high ( $S_H$ ) or low ( $S_L$ ) in 2017–2018 (we could not predict it in 2016) and continues afterwards for more 2 years. No any synergy after 2020. If synergy is successful ( $S_H$ ) in 2017–2018, it is more probable that synergy would be successful afterwards. If synergy in 2017–2018 is low ( $S_L$ ), then it is more likely that it will be lower in 2019–2020.

So, we have different decision branches. We suppose, that probability of successful integration (high synergy) of two companies is 50 % in 2017–2018. But in following years situation is different. If synergy was high in 2017–2018, it is more likely, that it would stay high in the following period. I also suggested that owning of a greater share of Bashneft's capital gives higher probability of successful integration of companies in the second period. So, if synergy was maximal in 2017–2018 and Rosneft owns 100 % of Bashneft shares, then the synergy would be also high in 2019–2020 with probability 80 %; if synergy was maximal in 2017–2018 and

Rosneft owns only 50.08 % of Bashneft, then probability of successful synergy in 2017–2018 is 60 %.

If synergy effect is low in 2017–2018, it will stay low with probability 60 %.

I have to make some assumptions about high ( $S_H$ ) and low ( $S_L$ ) synergy effects for a year. As mentioned above synergy effect in optimistic scenario was estimated 140 billion RUB or  $S_H = 45$  billion RUB for one year.

Minimum (or low) synergy I assume to be  $S_L = 15$  billion RUB. This scenario also implies, that acquisition does not create enough synergy and destroys value of Rosneft (Rosneft overpays for Bashneft).

The next step is the forecast cash flow of Bashneft.

Previously we estimated Bashneft's value in 2016:  $442 \leq V_B \leq 493$  billion RUB.

I have estimates cash flow from historic cash flow as well as by using Gordon's formula (second method). The sustainable net cash flow from operating and investing activities ( $NCF_{OIA}$ ) was about 42 (average, see Table 2, in optimistic scenario) and 30 (low oil price scenario). If we use discount rate  $R = 11$  % and suppose, that growth rate  $G = 2$  %, then we get the following value

$$V = \frac{NCF_{OIA}}{R - G} = \frac{42}{11\% - 2\%} = 467 \text{ billion RUB}$$

(optimistic scenario with high prices, which fully corresponds to the estimation above).

$$V = \frac{NCF_{OIA}}{R - G} = \frac{30}{11\% - 2\%} = 333 \text{ billion RUB}$$

(low oil price scenario), value in 2016.

The next parameter is the terminal value of Bashneft in 2020 (I suppose that Rosneft will sell all Bashneft's shares in 2020 and get terminal value back by cash), which I estimated in optimistic scenario as 495 billion RUB

$$V_{TV2020} = \frac{NCF_{OIA} \text{ in 2020}}{R - G} = \frac{45(1 + 0.02)^3}{11\% - 2\%} = 495, \\ \text{value in 2020.}$$

How much would Rosneft pay (by cash) to acquire the last 49.92 % shares of Bashneft in 2018? Taking into account the above calculation as well as valuation of Bashneft ordinary shares from Table 1, I can assume that reasonable payments for Bashneft in 2018 would be

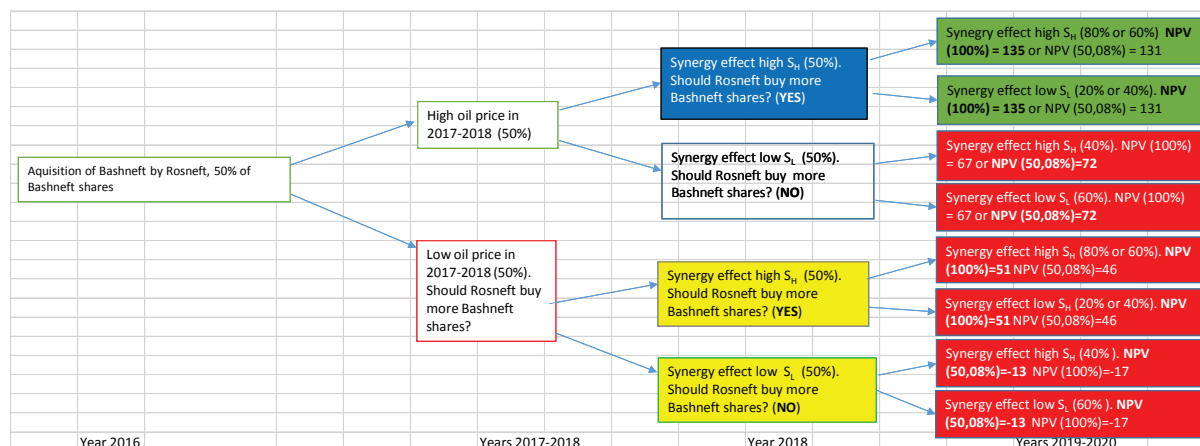


Fig. 3. Decision tree for Rosneft

$$P_{2018} = \frac{V_{TV2020}}{(1+0,11)^2} \times 0,4992 \times 1,03 =$$

$$= \frac{495}{(1+0,11)^2} \times 0,4992 \times 1,03 = 207 \text{ billion RUB.}$$

Note: this payment equals to discounted terminal value of 49,92 % of Bashneft shares with additional premium 3% (because Rosneft already has the control over Bashneft, premium paid is low)<sup>1</sup>.

The same calculations were made for low oil price

$$V_{TV2020} = \frac{NCF_{OIA} \text{ in 2020}}{R-G} = \frac{30(1+0,03)^3}{11\% - 2\%} = 354$$

and  $P_{2018} = 148$ .

First I analyze scenario of high oil price, which generates net cash from operating and investing activities  $NCF_{OIA} = 42$  billion RUB in 2017 (which is increasing with  $G = 2\%$  per year, see Table 2).

If price for oil is high in 2017 (and in my model it will stay high in future), then Rosneft has two options in 2018. One possibility is to buy the rest 49.92 % shares of Bashneft for 207 billion RUB in 2018 (cash payment). But in 2018 Rosneft already would know, whether the synergy was successful in 2017 (and we expect the same synergy in 2018). If the synergy is high ( $S_H = 45$  billion RUB in

2017 as well as in 2018, expected synergy in 2019 and 2020 calculated as weighted average  $S = 39$  as shown in Table 2), then discounted cash flow NPV = 135 billion RUB.

In case oil price high and synergy are high and Rosneft would buy only 50,08% shares of Bashneft in 2016 (would not buy more shares in 2018, so in 2020 the terminal value would be 248 billion RUB, which is 50,08% of market value of company), then

$$NPV = -289 + \frac{42+45}{1+0,11} + \frac{43+45}{(1+0,11)^2} +$$

$$+ \frac{44+(0,6 \times 45+0,4 \times 15)}{(1+0,11)^3} +$$

$$+ \frac{45+(0,6 \times 45+0,4 \times 15)+248}{(1+0,11)^4} =$$

$$= 131 \text{ billion RUB.}$$

So Rosneft in the most optimistic scenario (high oil price, high synergy in 2017 and 2018 – 45 billion RUB) should buy all Bashneft shares, because it gives maximum NPV = 135 billion RUB. But difference between these two scenarios is only 4 billion RUB, because synergies are different only in 2019 and 2020 (39 billion RUB – if Rosneft owns 100% of Bashneft; 27 billion RUB – if Rosneft owns 50.08 % of Bashneft).

Another branch of the decision tree – high oil price from 2017 and low synergy in 2017–2018. If Rosneft does not buy additional shares in 2018, then the synergy:  $S_L = 15$  billion RUB in 2017 and 2018, and in 2019 and 2020 synergy as a weighted average is  $S = 27$  as shown in Table 2) and discounted cash flow NPV = 72 billion RUB.

<sup>1</sup> The model is sensitive to payment  $P_{2018}$ , as well as additional premium. But in order to find out the role of synergy (which is different only from 2017 till 2020) I have to put premium at low level.



Table 2

Discounted cash flow for different scenarios and estimation of synergy, billion RUB <sup>1</sup>								
		2016	2017	2018	2019	2020	TV 2020	NPV
Cash paid for acquisition 50%	1	-330						
Cash from Bashneft's accounts	2	41						
High oil price								
Net cash flow from OIA, $NCF_{OIA}$ , Growth rate $G = 2\%$	3	0	42	43	44	45	495 or 248	
Synergy high $S_H$	4	0	45	45	45	45	0	
Synergy low $S_L$	5	0	15	15	15	15	0	
Scenario with buying more 49.92% of Bashneft shares for 207 (synergy high)	6			-207				
Synergy in 2017-2018	7 (4)		45	45				
Synergy (80%+20%)	8 (80%×4+20%×5)				39	39		
Cash flow after 2017	9 (3+6+7+8)		87	-119	83	84	495	
Discount factor for rate 11%	10	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	11 (9×10)	-289	78	-96	60	55	326	135
Scenario without buying more Bashneft (synergy high)	12			0				
Synergy in 2017-2018	13 (4)		45	45				
Synergy (60%+40%)	14 (60%×4+40%×5)				33	33		
Cash flow after 2017	15 (3+12+13+14)		87	88	80	81	248	
Discount factor for rate 11%	16	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	17 (15×15)	-289	78	71	56	51	163	131
Scenario without buying Bashneft (synergy low)	18			0				
Synergy in 2017-2018	19 (5)		15	15				
Synergy (40%+60%)	20 (40%×4+60%×5)				27	27		
Cash flow after 2017	21 (3+18+19+20)		57	58	71	72	248	
Discount factor for rate 11%	22	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	23 (21×22)	-289	51	47	52	47	163	72
Scenario with buying more 49.92% of Bashneft shares for 207 (synergy low)	24			-207				
Synergy in 2017-2018	25 (5)		15	15				
Synergy (40%+60%)	26 (40%×4+60%×5)				27	27		
Cash flow after 2017	27 (3+24+25+26)		57	-149	71	72	495	
Discount factor for rate 11%	28	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	29 (27×28)	-289	51	-121	52	47	326	67
Low oil price								
Net cash flow from OIA, $NCF_{OIA}$ , Growth rate $G=2\%$	30	0	30	31	31	32	354 or 177	
Synergy high $S_H$	31	0	45	45	45	45		
Synergy low $S_L$	32	0	15	15	15	15		
Scenario with buying more 49.92% of Bashneft shares for 148 (synergy high)	33			-148				
Synergy in 2017-2018	34 (31)		45	45				
Synergy (80%+20%)	35 (80%×31+20%×32)				39	39		
Cash flow after 2017	36 (30+33+34+35)		75	-72	70	71	354	
Discount factor for rate 11%	37	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	38 (36×37)	-289	68	-58	51	47	233	51
Scenario without buying Bashneft (synergy high)	39							
Synergy in 2017-2018	40 (31)		45	45				
Synergy (60%+40%)	41 (60%×31+40%×32)				33	33		
Cash flow after 2017	42 (30+39+40+41)		75	76	64	65	177	
Discount factor for rate 11%	43	1.00	0.90	0.81	0.73	0.66	0.66	
Discounted cash flow from 2016	44 (42×43)	-289	68	61	47	43	117	46
Scenario without buying Bashneft (synergy low)	45			0				
Synergy	46 (32)		15	15				
Synergy (40%+60%)	47 (40%×31+60%×32)				27	27		
Cash flow after 2017	48 (30+45+46+47)		45	46	58	59	177	

Table (end) 2

		2016	2017	2018	2019	2020	TV 2020	NPV
Discount factor for rate 11%	49	1,00	0,90	0,81	0,73	0,66	0,66	
Discounted cash flow from 2016	50 (49×50)	-289	41	37	43	39	117	-13
Scenario with buying more 49,92% of Bashneft shares for 148 (synergy low)	51			-148				
Synergy	52 (32)		15	15				
Synergy (40%+60%)	53 (40%31+60%32)				27	27		
Cash flow after 2017	54 (30+51+52+53)		53	-94	58	59	354	
Discount factor for rate 11%	55	1,00	0,90	0,81	0,73	0,66	0,66	
Discounted cash flow from 2016	56 (54×55)	-289	41	-83	43	39	233	-17

In the same circumstances if Rosneft buys more 49,92 % Bashneft's shares for 207 billion RUB in 2018, then

$$NPV = -289 + \frac{42+15}{1+0,11} + \frac{43+15-207}{(1+0,11)^2} + \frac{44+27}{(1+0,11)^3} + \frac{45+27+495}{(1+0,11)^4} = 67 \text{ billion RUB,}$$

which is a bit less than 72 billion RUB. So, if oil prices are high in 2017 and synergy effect is low, then optimum decision is do not acquire more Bashneft's shares, which generates NPV = 72 billion RUB.

Information about oil prices as well as synergy effect (high or low) in 2017 would be available for Rosneft in 2018, so it could be easy to make the right decision: buy more 49.92% of Bashneft's shares if oil price is high and synergy is high. In case synergy is low, Rosneft should not acquire more Bashneft's shares.

The same analyses is performed for low oil price. The result is that better to leave 50.08 % of Bashneft's shares and do not buy any more shares.

According to Real option model:

$$NPV = \frac{1}{2} \left[ \left( \frac{1}{2} 135 + \frac{1}{2} 72 \right) + \left( \frac{1}{2} 51 + \frac{1}{2} (-13) \right) \right] = 61 \text{ billion RUB.}$$

According to traditional model (if 100 % of Bashneft is bought in year 2016):

$$NPV = \frac{1}{2} \left[ \left( \frac{1}{2} 135 + \frac{1}{2} 67 \right) + \left( \frac{1}{2} 51 + \frac{1}{2} (-17) \right) \right] = 59 \text{ billion RUB.}$$

According to traditional model (if only 50% of Bashneft is bought in year 2016):

$$NPV = \frac{1}{2} \left[ \left( \frac{1}{2} 131 + \frac{1}{2} 72 \right) + \left( \frac{1}{2} 46 + \frac{1}{2} (-13) \right) \right] = 59 \text{ billion RUB.}$$

So, according to traditional model there is no difference, whether to acquire 100 % of Bashneft's shares immediately in 2016, or only 50.08 % (anyway, NPV = 59 billion RUB). But real option model allows to reach a better result by acquiring 50.08 % of Bashneft in 2016 and wait two years, observing market trend and synergy. If synergy was high in 2017, then more 49.92 % Bashneft should be bought in 2018. Real option model allows to generate higher NPV. We also can conclude, that value of the real option is 2 billion RUB.

### Conclusion

Only in one scenario with low oil price and low synergy effect, Rosneft should not buy 50,08 % of Rosneft. Probability of this scenario is only 25 % and in all other scenarios acquisition creates substantial positive value.

Real option model gives a more flexible approach for decision making. Merges and acquisitions are strategic decisions, and it is very difficult to forecast market environment and synergy effect simultaneously.

I would recommend Rosneft to acquire 50.08 % in 2016 (as it did) and wait two years in order to watch synergy effect. According to real option model, if synergy was high in 2017, then Rosneft should complete acquisition and buy more 49.92 % of Bashneft.

<sup>1</sup> These scenarios were based on trends in 2016-2018 and could not take into account the "Black Swan" of 2020 – situation with coronavirus. Furthermore, in most cases M&A strategy should be analyzed on data with limited horizon (2 years) after the deal.

Fast growth of Rosneft, including acquisition of Bashneft, requires a lot of long-term financing (assets and liabilities should correspond in time). Because company does not generate enough cash for such expansions, I believe, that better to move to organic growth and postpone takeover. At the same time Rosneft should be recommended to issue additional shares in order to decrease its high debts.

M&A deals in oil and gas sector in 2016 were considered as mega transactions. [21] The deal, which we discussed in the article, was one of them.

We should take into account not only financial calculations, but also correlation of strategies of both companies. In the case above both companies were operating in the same segment and used similar business models, but in different regions. That definitely improved probability of synergy effect and allowed to complete the deal successfully.

### References

1. Copeland T., Koller T., Murrin J. Valuation. Measuring & Managing the Value of the Company. Auflage, New York, 2000.
2. Grant R.M. Contemporary Strategy Analysis. 2015.
3. Hambrick D., Fredrickson J. Are you sure you have a strategy? // The Academy of Management Executive 2005. Vol. 19. No. 4. Pp. 51–62.
4. Kvint V. Strategy for the Global Market: Theory and Practical Applications. London, Sydney: Routledge NY, 2015. 520 p.
5. Brealey R., Myers S. Principles of Corporate Finance. Moscow: Olimp-Biznes, 2004. 1008 p. (In Russ.)
6. Fernandes N. Finance for Executives. A Practical Guide for Managers. 2014.
7. Demystifying deal making: Lessons from M&A veterans. McKinsey Quarterly. August 2019. Available at: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/demystifying-deal-making-lessons-from-m-and-a-veterans> (accessed: 05.10.2019).
8. «Rosneft» closed the deal for acquiring «Bashneft» shares. Available at: <https://www.kommersant.ru/doc/3114048> (accessed: 15.08.2019). (In Russ.)
9. Rosneft's press-release dated to December 18, 2017. Available at: <https://www.rosneft.ru/press/releases/item/189199/> (accessed: 17.08.2019). (In Russ.)
10. Ulyukaev valued synergy from acquiring of «Bashneft» by «Rosneft». Available at: <https://lenta.ru/news/2016/10/09/rosneft/> (accessed: 20.08.2019). (In Russ.)
11. «VTB Capital» disagree with Shuvalov in valuation of «Bashneft». Available at: [www.rbc.ru/business/04/08/2016/57a34c9e9a7947b8284d6458](https://www.rbc.ru/business/04/08/2016/57a34c9e9a7947b8284d6458) (accessed: 23.08.2019). (In Russ.)

12. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2016 with independent auditor's report. Available at: [https://www.rosneft.ru/docs/report/2015/eng/50\\_eng.html](https://www.rosneft.ru/docs/report/2015/eng/50_eng.html) (accessed: 17.07.2019). (In Russ.)

13. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2017 with independent auditor's report. Available at: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2017-ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2017-ENG.pdf) (accessed: 17.07.2019). (In Russ.)

14. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2018 with independent auditor's report. Available at: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2018-ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2018-ENG.pdf) (accessed: 17.07.2019). (In Russ.)

15. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2019 with independent auditor's report. Available at: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2019-ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2019-ENG.pdf) (accessed: 10.04.2020). (In Russ.)

16. AFK «Systema» would pay 100 billion RUB under the settlement agreement with «Rosneft». Available at: <https://www.kommersant.ru/doc/3507341> (accessed: 19.09.2019). (In Russ.)

17. Arzac E. Valuation for Mergers, Buyouts and Restructuring. 2004. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=570361](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=570361) (accessed: 18.07.2019).

18. Dinica M.C. The Real Options Attached to an Investment Project. *Economia seria management*. 2011. Vol. 14. No. 2. Pp. 511–518. Available at: <http://management.ase.ro/reveconomia/2011-2/23.pdf> (accessed: 16.07.2019).

19. Thijssen J. Optimal and Strategic Timing of Mergers and Acquisitions Motivated by Synergies and Risk Diversification. *Journal of Economic Dynamics and Control*. 2008. Vol. 32. No. 5. Pp. 1701–1720. DOI: 10.1016/j.jedc.2007.06.016

20. Lambrecht B. The timing and terms of takeovers under uncertainty: a real options approach. *IMS Working Paper*. 2001. DOI: 10.2139/ssrn.292980

21. KPMG presents the results of a survey of Russia's mergers and acquisitions market in 2017. Available at: <https://home.kpmg/ru/en/home/media/press-releases/2018/03/ma-survey-2017.html> (accessed: 20.06.2019).

### Библиографический список

1. *Copeland T., Koller T., Murrin J.* Valuation. Measuring & Managing the Value of the Company. Auflage, New York, 2000.
2. *Grant R.M.* Contemporary Strategy Analysis. 2015.
3. *Hambrick D., Fredrickson J.* Are you sure you have a strategy? // The Academy of Management Executive. 2005. V. 19. N 4. P. 51–62.
4. *Kvint V.* Strategy for the Global Market: Theory and Practical Applications. London, Sydney: Routledge NY, 2015. 520 p.
5. *Брейли Р, Майерс С.* Принципы корпоративных финансов. М.: Олимп-Бизнес, 2004. 1008 с.
6. *Fernandes N.* Finance for Executives. A Practical Guide for Managers. 2014.
7. Demystifying deal making: Lessons from M&A veterans. McKinsey Quarterly. August 2019. URL: <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/demystifying-deal-making-lessons-from-m-and-a-veterans> (дата обращения: 05.10.2019).
8. «Роснефть» закрыла сделку по покупке акций «Башнефти». URL: <https://www.kommersant.ru/doc/3114048> (дата обращения: 15.08.2019).
9. Совет директоров «Роснефти» утвердил план финансово-хозяйственной деятельности на 2018–2019 гг. URL: <https://www.kommersant.ru/doc/3114048> (дата обращения: 15.08.2019).
10. Улюкаев оценил синергию от покупки «Роснефтью» «Башнефти». URL: <https://lenta.ru/news/2016/10/09/rosneft/> (дата обращения: 20.08.2019).
11. «ВТБ Капитал» разошелся с Шуваловым в оценке стоимости «Башнефти». URL: <https://www.rbc.ru/business/04/08/2016/57a34c9e9a7947b8284d6458> (дата обращения: 23.08.2019).
12. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2016 with independent auditor's report. URL: [https://www.rosneft.ru/docs/report/2015/eng/50\\_eng.html](https://www.rosneft.ru/docs/report/2015/eng/50_eng.html) (дата обращения: 17.07.2019).
13. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2017 with independent auditor's report. URL: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2017\\_ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2017_ENG.pdf) (дата обращения: 17.07.2019).
14. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2018 with independent auditor's report. URL: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2018\\_ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2018_ENG.pdf) (дата обращения: 17.07.2019).
15. Consolidated financial statements Rosneft Oil Company for the year ended December 31, 2019 with independent auditor's report. URL: [https://www.rosneft.com/upload/site2/document\\_cons\\_report/Rosneft\\_FS\\_12m2019\\_ENG.pdf](https://www.rosneft.com/upload/site2/document_cons_report/Rosneft_FS_12m2019_ENG.pdf) (дата обращения: 10.04.2020).
16. АФК «Система» выплатит 100 млрд рублей по мировому соглашению с «Роснефтью». URL: <https://www.kommersant.ru/doc/3507341> (дата обращения: 19.09.2019).
17. Arzac E. Valuation for Mergers, Buyouts and Restructuring. 2004. URL: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=570361](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=570361) (дата обращения: 18.07.2019).
18. *Dinica M.C.* The Real Options Attached to an Investment Project // Economia seria management. 2011. V. 14. N 2. P. 511–518.
19. *Thijssen J.* Optimal and Strategic Timing of Mergers and Acquisitions Motivated by Synergies and Risk Diversification // J. Economic Dynamics and Control. 2008. V. 32. N 5. P. 1701–1720. DOI: 10.1016/j.jedc.2007.06.016
20. *Lambrecht B.* The timing and terms of takeovers under uncertainty: a real options approach // IMS Working Paper. 2001. DOI: 10.2139/ssrn.292980
21. KPMG presents the results of a survey of Russia's mergers and acquisitions market in 2017. URL: <https://home.kpmg/ru/en/home/media/press-releases/2018/03/ma-survey-2017.html> (дата обращения: 20.06.2019).

### Информация об авторах / Information about the authors

**Kirill L. Astapov** – Dr. Sci. (Econ.), Professor of Economic and Financial Strategy Department, [ast\\_k@mail.ru](mailto:ast_k@mail.ru), <https://orcid.org/0003-4766-4421>, Centre of Strategic Research, Moscow School of Economics, Lomonosov Moscow State University, 1-61 Leninskie Gory, Moscow 119991, Russia.

**Астапов Кирилл Леонидович** – д-р экон. наук, профессор кафедры Экономическая и финансовая стратегия, [ast\\_k@mail.ru](mailto:ast_k@mail.ru), <https://orcid.org/0003-4766-4421>, Московской государственной университет имени М.В. Ломоносова, Московская школа экономики, 119991, Москва, Ленинские горы, д. 1, стр. 61.

Поступила в редакцию 05.12.2019 г.; после доработки 03.05.2020 г.; принята к публикации 04.06.2020 г.