Investors have to review regularly their forecasts and stock value estimates taking into consideration the imposition of sanctions against Russian companies. Due to the presence of behavioral effects, as well as to the incorrect accounting of incoming information, the risk of obtaining inaccurate stock value estimates increases. In this regard, a mechanism should be developed for adequate update of stock value estimates upon receipt of new information signals about the imposition of sanctions.

The study is based on such methods as analysis, synthesis, the longitudinal method, as well as the method of discounted cash flows. The study is based on the dynamics of financial indicators of stock returns of the 40 most marketable Russian companies.

A mechanism is proposed for accounting the informational signals about sanctions, which makes it possible to avoid behavioral effects and update adequately the intrinsic stock value estimates upon receipt of new information on the imposition of sanctions.

This mechanism makes it possible to consider both changes in expectations regarding cash flows and changes in the cost of capital for companies. At the same time, the research in this field should be continued in order to develop a methodology for equity capital valuation adjustment that will be instrumental in consideration of variance in bias and emergence of the so-called “thick tails” in the distribution of stock returns under receipt of information signals on the imposition of sanctions.

Galkin, A. S., Gurov, I. N., & Studnikov, S. S. (2020). Accounting mechanism for information signals about the imposition of sanctions in valuation of a company. Economic consultant, 29 (1), 57-64. doi: 10.46224/ecoc.2020.1.6
INTRODUCTION

Upon receipt of official information or rumors about sanctions, it is required to revise the estimates of the intrinsic value of companies. The lack of a holistic accounting mechanism for the impact of sanctions on a company’s value can lead to negative consequences such as demonstration of behavioral effects by investors and analysts. In this regard, the present study is concerned with the development of an accounting mechanism for information signals on the introduction of sanctions in stock value estimation.

MATERIALS AND METHODS

The impact of sanctions on the economic environment, the activities of companies and the capital market conditions has been studied in a number of articles [1-6]. A study conducted by Hoffman and Neuenkirch [7] revealed that during the periods of particular tension in the Ukrainian conflict, the Russian stock market became more volatile by 6.5%, compared with the usual state (for comparison, the volatility of the Ukrainian stock market increased approximately by 8.7% on average). Kholodilin et al. [8] indicate that the impact of sanctions on the stock market is negligible, compared with the dynamics of the stock market over the past 10 years.

Despite the existence of conventional methods for valuation of a business based on a discounted cash flow model [9], in the authors’ opinion, there is a need to develop an accounting mechanism for information signals on the imposition of sanctions, which can be used during the renewal of the intrinsic stock value estimates.

This study was conducted on the basis of data on Russian public companies for 2012-2017. The sampling included 40 Russian public companies grouped in 10 industries. Sanctions were imposed on 11 companies included the presented sampling [10], the rumors about the imposition of sanctions regarded 10 companies (but no sanctions were imposed). No sanctions were expected or imposed on the remaining 19 companies.

RESULTS

In accordance with the discounted cash flow model, the intrinsic value of a financial asset depends on expected cash flows and risks, the value of which reflects the capital value.

Either expected cash flows related to shareholders (for example, free cash flow for shareholders or dividends) or expected cash flows for all shareholders (for example, free cash flow for a firm) are used for the purposes of stock value estimation. In both cases, cash flow can be influenced by general economic factors (in particular, GDP growth rate, real disposable
household income), and industry factors (e.g., market volume growth rate), as well as the factors related to the company (expected market share, revenue growth rate, sales margins, capital investments, opportunities for debt acquisition). If information signals on the imposition of sanctions lead to a change in investors' expectations regarding any of these factors, then the assessment of the company's internal value should also change.

Likewise, a change in investors' expectations regarding any of the components of the capital value will result in a change in the company's intrinsic value. Practically, in the process of stock value estimation, either the weighted-average cost of capital or the equity value is used. The value of the weighted-average cost of capital depends on the debt load of the company, the marginal income tax rate, the cost of debt financing and the equity value. In accordance with the CAPM model, the equity value depends on the risk-free interest rate, the value of the market risk premium, and the company's beta coefficient.

Thus, the emergence of information signals affects the value of companies by influencing the following determinants of value:

1. Risk-free interest rate
2. Market risk premium
3. Non-leveraged company's stock beta coefficient
4. Debt load rate
5. Debt value of the company
6. Current financial performance of the company
7. Economic and industry growth rates
8. Expected change in cash flows of the company.

The imposition of sanctions can change the value of a company's capital (p. 1-5) and expected cash flows (p. 6-8). According to the authors’ calculations, 34 examined companies of 40 had statistically significant changes in beta coefficients due to the imposition of sanctions. At the same time, the companies that did not fall under the sanctions, as a rule, had a decrease in beta coefficients (with some exceptions for oil and gas, construction, and telecommunication industries). The sanctioned companies had an increased beta coefficient only in the oil and gas industry, and a decreased beta coefficient in the metallurgy and banking sectors.

There was also a statistically significant increase in the risk-free rate and an increase in the market risk premium due to the imposition of sanctions. These results are adjusted to the effects of oil price drop. Interestingly, in some cases, the effect of an increase in the market risk premium turned out to be stronger than a decrease in the beta coefficient. For example, in 2015, the market risk premium for such companies as MMK, Acron, RusHydro, and Mosenergo increased slightly against the background of a significant drop in the beta coefficients of these companies. Along with the increase in the risk-free rate, this resulted in an increase in the equity value of these companies.

The industry affiliation and business model of the company determine the nature of the impact of sanctions on the cash flows of these companies. In this regard, when assessing
the impact of sanctions, not only the expected dynamics of macroeconomic indicators (in particular, GDP growth rates, real disposable household income, real population consumption) should be considered, but also the factors specific to the company (the volume of the market in which it operates, market share, restrictions on the import of components, fixed assets and export of products, investment and financial plans, level of costs) [11]. As for the expected cash flows of Russian public companies, analysts’ expectations regarding the cash flows of many companies with currency earnings were rather optimistic during the imposition of sanctions. It is also required to take into account the effect of the depreciation of exchange rates, as cash flows denominated in rubles may increase when the ruble depreciates against the dollar. In particular, the positive yield of shares of oil and gas and metallurgical companies for the period of ownership in 2015 is associated with the depreciation of the ruble (the dynamics of stock returns are presented in Table 1).

Table 1 Dynamics of stock returns of Russian companies for the period of ownership

| Sector            | Company         | Stock returns for the period of ownership |
|-------------------|-----------------|------------------------------------------|
|                   |                 | Before sanctions | Onset of sanctions | Habitation to sanctions |
|                   |                 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Oil and Gas       | Gazprom (c)     | -11% | -2%  | -1%  | 7%   | 19%  | -12% |
|                   | Rosneft (c)     | 30%  | -3%  | -17% | 33%  | 64%  | -28% |
|                   | Lukoil (c)      | 22%  | 8%   | 12%  | 9%   | 55%  | -1%  |
|                   | Novatek (c)     | -10% | 17%  | 11%  | 32%  | 36%  | -12% |
|                   | Gazprom Neft (c)| 1%   | 12%  | 4%   | 14%  | 39%  | 15%  |
|                   | Tatneft         | 42%  | -2%  | 14%  | 38%  | 38%  | 13%  |
|                   | Surgutneftegaz (c)| 8%  | 3%   | -15% | 43%  | -7%  | -11% |
| Metals and mining | Nornickel       | 22%  | -2%  | 62%  | 9%   | 16%  | 10%  |
|                   | NLMK (c)        | -2%  | -15% | 24%  | 1%   | 94%  | 38%  |
|                   | Severstal       | 5%   | -16% | 60%  | 35%  | 65%  | 5%   |
|                   | Mechel          | -22% | -70% | -63% | 160% | 179% | -20% |
|                   | Polus           | -9%  | -9%  | 32%  | 187% | 54%  | 8%   |
|                   | Raspadskaya     | -41% | -50% | -24% | 29%  | 166% | 9%   |
|                   | MMK (c)         | -16% | -29% | 54%  | 72%  | 82%  | 33%  |
| Transportation    | Aeroflot        | -7%  | 84%  | -59% | 69%  | 172% | 3%   |
|                   | NMTP            | -10% | 7%   | -58% | 226% | 89%  | 31%  |
|                   | Utair           | 39%  | -2%  | -64% | 33%  | -9%  | -14% |
| Banks             | Sberbank (c)    | 20%  | 5%   | -43% | 80%  | 73%  | 28%  |
|                   | VTB (c)         | -7%  | -7%  | 37%  | 20%  | -6%  | -34% |
|                   | Bank Saint-     | -31% | -17% | -41% | 85%  | 56%  | -19% |
|                   | Petersburg      |      |      |      |      |      |      |
| Retail            | Magnit          | 71%  | 87%  | 7%   | 17%  | 1%   | -41% |
|                   | M. Video        | 37%  | 38%  | -52% | 137% | 52%  | 7%   |
|                   | Dixy            | 39%  | -4%  | -12% | -15% | -8%  | 14%  |
For the purposes of accounting of the impact of information signals about sanctions on the value of companies, it is required to form expectations and update the financial model of the company. The mechanism proposed below is applicable both for the renewal of the intrinsic value estimates of the sanctioned companies and for the valuation of the companies affected by the sanctions only indirectly.

![Figure 1](image-url)

**Source:** calculated by the authors

| Industry                        | Company          | 61% | -20% | 79% | 66% | 0%  | 1%  |
|---------------------------------|------------------|-----|------|-----|-----|-----|-----|
| Chemistry and petrochemistry    | Phosagro         | 61% |      |     |     |     |     |
|                                 | Uralkali         | 3%  | -23% | -23%| 36% | -7% | -30%|
|                                 | Acron            | 8%  | -13% |     | 74% | 114%| 3%  | 19% |
| Power industry                  | FSK EES          | -28%| -57% | -49%| 27% | 264%| -14%|
|                                 | Rushydro         | -23%| -22% | -2% | 22% | 42% | -17%|
|                                 | Mosenergo        | -20%| -34% | -22%| 27% | 210%| 8%  |
|                                 | Inter RAO        | -29%| -60% | -24%| 39% | 249%| -9% |
|                                 | Rosseti          | -15%| -62% | -46%| 7%  | 152%| -29%|
| Engineering                     | AvtoVAZ          | -19%| -33% | -23%| 9%  | 3%  | 4%  |
|                                 | Kamaz            | 7%  | 39%  | -49%| 35% | 38% | 7%  |
|                                 | Sollers          | 123%| 31%  | -53%| 14% | 33% | 15% |
| Construction and real estate    | PIK Group        | -13%| 9%   | 172%| 14% | 32% | 12% |
|                                 | LSR Group        | 27% | 10%  | -18%| 59% | 53% | -8% |
|                                 | Mostotrest (c)   | 1%  | -23% | -45%| 23% | 32% | 71% |
| Engineering                     | PIM Group        | -13%| 9%   | 172%| 14% | 32% | 12% |
| Construction and real estate    | LSR Group        | 27% | 10%  | -18%| 59% | 53% | -8% |
|                                 | Mostotrest (c)   | 1%  | -23% | -45%| 23% | 32% | 71% |
| Construction and real estate    | MTS              | 42% | 38%  | -41%| 35% | 36% | 15% |
|                                 | Rostelecom       | -18%| -10% | -19%| 3%  | -1% | -19%|
|                                 | Megafon          | 1%  | 57%  | -20%| 3%  | -18%| -3% |
| Construction and real estate    |                  |     |      |     |     |     |     |
| Construction and real estate    | MICEX full profitability index | 2%  | -1%  | -7% | 23% | 27% | -8% |

**Figure 1** Accounting mechanism for information signals on the imposition of sanctions in the valuation of a company

### The receipt of information signals on the imposition of sanctions

1. Renewal of the estimate of the beta coefficient
   - How will sanctions affect the industry beta coefficient?
   - Will the company become more or less risky relative to the industry average?

2. Renewal of the estimate of the expected risk-free rate
   - Can the information signal lead to a change in the risk-free rate?

3. Renewal of the estimate of the market risk premium
   - Can the information signal lead to a change in the value of the market risk premium?

4. Renewal of the estimate of the debt value
   - Can the information signal lead to a change in the risk-free rate?
   - Can the information signal lead to a change in the credit default spread?
   - Can the information signal lead to a change in the financial situation and a revision of the credit rating of the company?
5. Renewal of the estimate of changes in the capital structure
   → Will the information signal affect the company's plans for implementing investment projects, debt service, dividend payout?
   Will the information signal affect the change in exchange rates (if the company has foreign currency debt)?
   Will the information signal affect the ratio of the stock market value to the market value of the financial obligations of the company?

6. Renewal of the estimate of expected cash flows
   → How do company cash flows depend on macroeconomic conditions?
   How will the sanctions affect the macroeconomic performance of the company?
   How will the sanctions affect the company's market share?
   How can imposed sanctions affect the purchase prices of raw materials and fixed assets?
   How can the imposed sanctions affect product sales prices (including export sales conditions)?
   How will the imposed sanctions affect the company's ability to acquire technology and implement investment projects?
   How will the sanctions affect the long-term growth rate of the company's cash flows?

↓ ↓ ↓

Accounting for expected changes in the capital value estimation and in the financial model of the company

↓

Renewed company's intrinsic value estimate

**DISCUSSION**

In accordance with the discounted cash flow model, the intrinsic value of a financial asset depends on the expected cash flows and risks, the value of which reflects the capital value.

Either expected cash flows related to shareholders (for example, free cash flow for shareholders or dividends) or expected cash flows for all shareholders (for example, free cash flow for a firm) are used for the purposes of stock value estimation. In both cases, cash flow can be influenced by general economic factors (in particular, GDP growth rate, real disposable household income) and industry factors (e.g., market volume growth rate), as well as the factors related to the company (expected market share, revenue growth rate, sales margins, capital investments, opportunities for debt acquisition). If information signals on the imposition of sanctions lead to a change in investors' expectations regarding any of these factors, then the assessment of the company's internal value should also change.

Likewise, a change in investors' expectations regarding any of the components of the capital value will result in a change in the company's intrinsic value. Practically, in the process of stock value estimation, either the weighted-average cost of capital or the equity value is used. The value of the weighted-average cost of capital depends on the debt load of the company, the
marginal income tax rate, the cost of debt financing [12] and the equity value. In accordance with the CAPM model, the equity value depends on the risk-free interest rate, the value of the market risk premium, the company's beta coefficient and debt burden [13].

Companies against which targeted sanctions were not imposed may also be negatively affected by the fact that sanctions may be of a sectoral nature or reduce economic activity in general. The accounting mechanism for information signals on the imposition of sanctions can also be applied to such companies, since it allows reviewing the indicators common to the capital market (risk-free rate, market risk premium), considering the change in the beta coefficient, and also updating the expectation regarding the cash flows of companies.

**CONCLUSION**

When the news background is filled with information about the imposition of sanctions, investors and analysts are especially likely to demonstrate behavioral effects. In this regard, it is required to adhere to a predetermined mechanism for estimates renewal. This will make it possible to give more accurate estimates than average market ones, since under the conditions of such a news background, the hypothesis of market efficiency in a semi-strong setting may be fulfilled [14], according to which: “if any information is immediately and completely reflected in the price of the asset, then the market, in which this asset is traded, can be called effective.”

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