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# Analysis of the Volatility of Cash Flows in the Field of Labor Relations for Monitoring the Sustainability of the Russian Economy

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## ABSTRACT

The aim of this research paper is to assess the applicability of the payment system data provided by the Bank of Russia for a prompt monitoring of the labor relations situation. Considering the growth of precarization, the change in the dynamics of labor relations is considered in the article as an operational indicator of the onset of potential economic crises. Taking the Bank of Russia payment system data as a basis, it is possible to use the volatility of cash flows information in the field of labor relations to determine the state of the economy. A methodological approach to determining critical values of this indicator by applying the three-sigma rule is also given in the article. In addition, the research paper investigates the relationship between the emergence of non-standard practices of interaction between economic actors in the labor market and values of the cash flow in the field of labor relations.

**Keywords:** labor relations; critical values; volatility of cash flows; precarization; working conditions; remote employment; Bank of Russia payment system; economic security

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## INTRODUCTION

According to Presidential Decree of the Russian Federation No. 400 of 02.07.2021 “On the National Security Strategy of the Russian Federation”, the key national interest is “saving the people of Russia, developing human potential, improving the quality of life and well-being of citizens”. To achieve this goal, it is necessary to create a system of indicators that would allow for operational monitoring of the economy and, consequently, the application of operational tools of influence.<sup>1</sup> An example of an operational labour market intervention tool used during the COVID-19 could be providing subsidies for the employers to hire the unemployed.<sup>2</sup> Implementing operational monitoring system requires high-frequency data available in payment systems.

The Bank of Russia Payment System (PS BR) receives information on cash flows in real time. A significant advantage of using data from the PS BR is the absence of negative effects of asymmetry of information and moral hazard [1]. The Bank of Russia can record the fact of payment without requesting the relevant information from the participants of PS BR. It is obvious that cash flows respond quickly to the changes in the direction of actions of economic actors, so that information about their volatility can be used to identify possible crisis phenomena at an early stage [2]. However, cash flows are heterogeneous and will be less volatile in the production sector than in financial markets due to the existence of speculative transactions. The latter determines the need to assess the applicability of cash flows in different areas to implement operational monitoring. A promising area is the analysis of cash flows in employment and recruitment (labour cash flow).

The field of labour relations depends on the current trends in the economy. Changes in the institutional environment and the possibility to work remotely lead to an increased precarisation effect [3],<sup>3</sup> which implies the emergence of unstable employment and earnings, as well as the likelihood of changes in the field of employment [4]. Therefore, labour market conditions are closely linked to the economic cycle [5]. Reduced employee protection and limited periods of employment contracts lead to an increased risk of job loss, which causes an increase in the volatility of the labour cash flow. Its reaching critical values is an indicator of crisis phenomena in the labour market.

## THE DYNAMICS OF LABOUR REGULATION IN RUSSIA

Increased labour mobility is associated with the precarisation effect, which can be assessed by analysing various statistical indicators. Workers themselves are not interested in an unstable employment relationship leading to a reduced ability to plan income and a lower level of social security, as they must look for a new job after the project ends to regain their previous level of income. The latter has encouraged the emergence of various digital platforms, such as Talent Cloud in Canada.<sup>4</sup> This process is obviously accompanied by an increase in the volatility of the labour cash flow.

The extent of this process depends on the prevailing situation on the labour market. The level of precarisation of labour relations can be assessed by analysing the regulatory framework. Several stages in the development of labour relations regulation in Russia can be distinguished, including the period of the RSFSR/USSR, the transition from Soviet legislation to the modern system of labour

<sup>1</sup> Methodology Weekly activity index. URL: <https://www.bundesbank.de/en/statistics/economic-activity-and-prices/weekly-activity-index/methodology-833982#tar-2>

<sup>2</sup> URL: <http://duma.gov.ru/news/51043/>

<sup>3</sup> “Precarisation of employment — precarious employment, lack of job security related to protection against arbitrary dismissal, regulation of the hiring and firing process”.

<sup>4</sup> URL: <https://talent.canada.ca/en/talent-cloud/>

relations regulation, and the modernisation of labour legislation during periods of crisis. An analysis of the focus of legal regulation since the creation of the RSFSR should be conducted from the perspective of the continuity of modern Russian labour relations legislation with the labour legislation of the 20th century.

*Stage 1: Regulation of labour relations during the RSFSR/USSR period*

Labour legislation developed considerably during the RSFSR/USSR period, when unified approaches to the labour regulation system were introduced. The Labour Code legislation (the Labour Code), adopted in 1918,<sup>5</sup> set out the requirements for labour organisation under the new conditions. It established universal labour conscription and the right to work from the age of 16 to 50. Labour became the duty of the individual. It was a priority for the state to ensure the employment of citizens.

The Labour Code of RSFSR of 1922<sup>6</sup> retained the basic approaches to labour conscription, but it adjusted the age groups. Labour duty was imposed on persons over 18 years of age and under 40 years of age — for women and under 45 — for men. The rules governing the employee-employer relationship were detailed. The contract of employment prescribed remuneration for labour and the complexity of the work was taken into consideration in determining the amount of remuneration. The Labour Code of 1922 increased workers' guarantees, including the right to terminate the contract of employment at their own request.

The Labour Code of the RSFSR of 1971<sup>7</sup> complicated the process of termination of the employment contract, in particular the term

of provisional termination was increased from seven days to two months. Aspects related to special working conditions for persons combining work and study were included in the labour law. The penalties for breaches of labour law were increased.

The RSFSR thus established a well-developed system for regulating labour relations, which was characterised by the protection of workers' interests and thus minimised instability on the labour market. There was no precarisation effect.

*Stage 2: Transition from USSR legislation to the modern system of labour regulation*

The labour legislation of the Russian Federation until 2001 applied the provisions laid down in the Labour Code of the RSFSR. A distinctive feature of the new labour law was the abolition of conscription. Since it provided for the right to work (rather than an obligation), labour mobility increased, as the employer and the employee had more opportunities to change the terms and conditions of labour relations. The current version of the Russian Labour Code establishes special labour conditions for certain groups of workers, such as those working on a rotational, shift or seasonal basis. These conditions are aimed at providing targeted support for the employment of certain categories of citizens.

After the collapse of the USSR, the precarisation of labour relations in Russia has increased. Citizens are not obliged to work, but they have the right to work, which they can exercise at their own will. The latter affects the increased mobility of labour flows and, consequently, the increased volatility of money flows in labour relations.

*Stage 3: Modernising labour law in crisis*

The COVID-19 pandemic has led to societal demand for labour market regulation in crisis. In particular, the practice of telecommuting, which was introduced into the system of legal regulation in 2013, became widespread. Distance working regulation was addressed

<sup>5</sup> Labour Code of 1918. URL: <https://docs.cntd.ru/document/901889837>

<sup>6</sup> Resolution of the All-Russian Central Executive Committee of 09.11.1922 "On the Enactment of the Code of Labour Laws of the R.S.F.S.R.", edited in 1922 (together with the "Code of Labour Laws of the R.S.F.S.R."). URL: <http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=3889#nRAeMYTM76Xj44hx>

<sup>7</sup> Law of the RSFSR of 09.12.1971 "On Approval of the Labour Code of the RSFSR" (together with the Code). URL: [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_1035/](http://www.consultant.ru/document/cons_doc_LAW_1035/)

by the introduction of supplementary agreements to employment contracts. During the pandemic, the employer's authority to enable the employee to switch to telecommuting and to provide him or her with everything necessary to carry out the work [6] was expanded.

Thus, the field of labour regulation has become more adaptable to crisis phenomena. It seems relevant to develop an operational indicator of the state of the economy that considers the changes in labour relations through the analysis of cash flows.

### DESCRIPTION OF DATA AND ASSESSMENT METHODOLOGY

For operational monitoring of labour relations to ensure economic security, it is advisable to use PS BR data. The Bank of Russia, as the operator of the PS BR, has access to high-frequency data on the volume of cash flows in various industries, grouping them in accordance with OKVED codes approved by Order No. 14-st of Rosstandart dated 31.01.2014. For operational monitoring, it is advisable to analyse cash flow in employment and recruitment. This activity involves accounting for operations related to maintenance of the list of vacancies, analysis of incoming applications and assistance in selecting applications to replenish human resources. An increase in the size of this cash flow reflects an increase in the demand of individuals and companies for job/employee search services.

In times of crisis, there is a need to look for new jobs and the mobility of labour flows increases. The latter is reflected in an increase in peak workloads for recruitment agencies and a corresponding increase in cash flows. Thus, information on cash flow in the PS BR will allow to identify the occurrence of non-standard interaction practices which allow to predict a high probability of a crisis in the Russian economy. Increased volatility of cash

flows can be linked to both institutional and behavioural factors. Operational instruments should be used primarily to neutralise the sources of increased volatility related to behavioural factors.

To assess the volatility of cash flow, consider the period from 30 March — 3 April 2020 to 26–30 September 2022 and “changes in seasonally smoothed data of the average daily incoming financial flow per week by OKVED 2 classes for the country as a whole, as a% of the average daily incoming financial flow for 2019”.<sup>8</sup> The average value for the period under review was 0.0026.

The three-sigma rule is used to determine the critical values of labour market cash flow, which involves estimating average values and standard deviations [7]. The critical values of the indicator will be calculated by adding and subtracting the two standard deviations. The outlier values (above the range) will reflect the fact of turbulent cash flow, characteristic of the panic actions of economic actors. It should be noted that the average and standard deviations were estimated separately for each year (*Table 1*). The average values of the cash flow in question demonstrate the presence of significant differences in the dynamics of its movement.

The breakdown by year is because labour relations in 2020 and 2022 were obviously different, making it impossible to apply a single range of critical values over the entire period. It is possible to calculate the exact range of maintaining structural conditions by applying fractal analysis. Combining the whole cash flow into one time series would not allow for the effects of the external environment, for example the COVID-19 pandemic, to be considered. Therefore, it is advisable to keep the range of calculated critical values on a certain time horizon.

<sup>8</sup> URL: <https://www.cbr.ru/analytics/finflows/>

Table 1

## Ranges of critical values of the cash flow “employment and recruitment”

Indicator	2020	2021	2022
Average value	-0.061	-0.006	0.08
Standard deviation	0.098	0.137	0.12
Average plus two standard deviations	0.135	0.269	0.321
Average minus two standard deviations	-0.258	-0.280	-0.16

Source: compiled by the authors.



Fig 1. Critical values for cash flow “employment and recruitment”

Source: compiled by the authors.

### INTERPRETATION OF THE OBTAINED RESULTS

The conducted analysis of cash-flow dynamics in labour relations has allowed us to identify critical values, the deviation from which the fact of abnormal situations in the labour market reflects (Fig. 1). It should be noted that the period in question is a crisis period due to the COVID-19 pandemic, but the comparison is still with 2019, which in turn is “sustainable”.

The analysis of the critical range indicates an increase over the period, which is probably due to the increased demand from individuals to look for new jobs. The upper values of the indicator in question are characterised by

faster growth than the lower range of critical values (Fig. 2).

Applying this information, a range of critical values can be established for subsequent periods. The R<sup>2</sup> values for the constructed trend lines were 0.826 for the upper critical level and 0.4664 — for the lower critical level.

By drawing the trend line, it is possible to predict further trends of its changes.<sup>9</sup> In this example, the trend line was predicted until the end of 2022 (Table 2).

<sup>9</sup> Given that trend lines are drawn for critical values and not for the time series in question, the indicated R<sup>2</sup> values are acceptable.

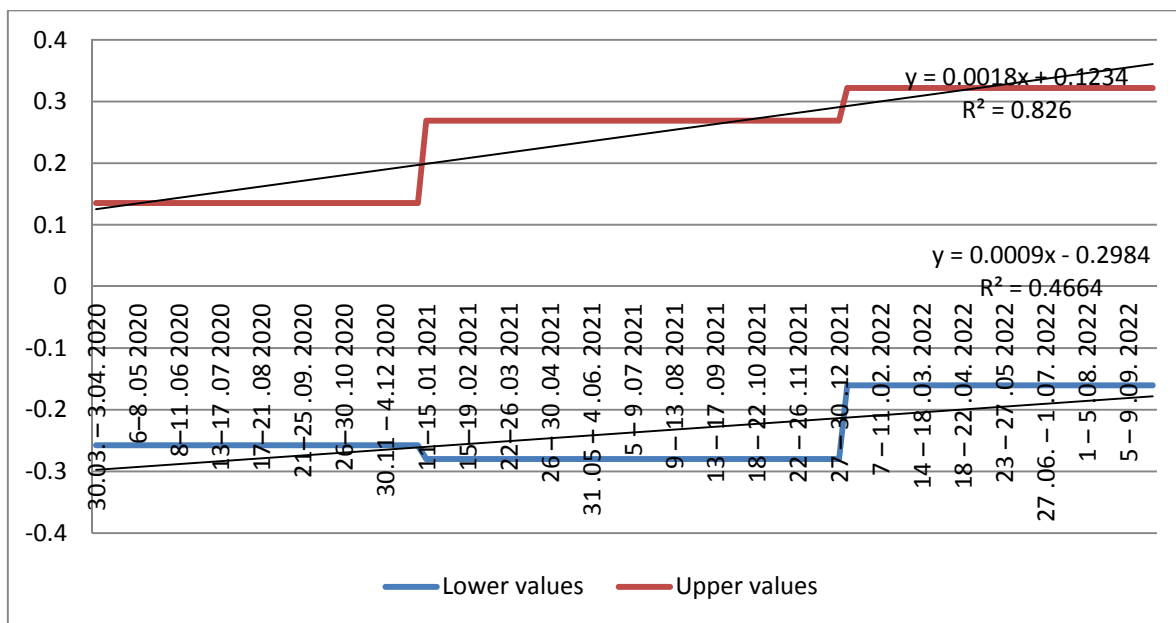


Fig 2. Assessment of the range of critical values of the cash flow indicator "employment and recruitment"

Source: compiled by the authors.

Table 2

### Forecast of values for future periods

Period	Lower values	Upper values
3–7 October 2022	–0.1814	0.3574
10–14 October 2022	–0.1805	0.3592
17–21 October 2022	–0.1796	0.361
24–28 October 2022	–0.1787	0.3628
31–2 November 2022	–0.1778	0.3646
7–11 November 2022	–0.1769	0.3664
14–18 November 2022	–0.176	0.3682
21–25 November 2022	–0.1751	0.37
28 November – 2 December 2022	–0.1742	0.3718
5–9 December 2022	–0.1733	0.3736
12–16 December 2022	–0.1724	0.3754
19–23 December 2022	–0.1715	0.3772
26–30 December 2022	–0.1706	0.379
Average for the period in question	–0.176	0.3682

Source: compiled by the authors.



Table 3

**Practical aspects of the development of an approach to the operational assessment of the state of the economy**

Directions	Characteristics
Accounting for other sectors of the economy	An assessment of the operational economy can be made by analysing additional indicators based, among other things, on passenger traffic, electricity consumption, etc. The application of a system of operational indicators will make it possible to create a comprehensive index of the operational status of the economy
Forming a set of actors	The Bank of Russia may select target groups of entities to be analysed using the PS BR data. It is possible to analyse cash flows in labour relations for a specific region
Development of a classifier of operational impact tools	To apply policy interventions promptly, authorities should have a range of tools available to them when they identify an increase in cash flow volatility. The rapid application of leverage instruments contributes to the effectiveness of public policies to ensure sustainability
Developing platform solutions for labour relations	The development and implementation of platform solutions in the employment relationship will enable a rapid job search in the event of contract termination in previous employment. In this way, digital platforms act as a self-regulating infrastructure which allows to compensate for possible labour market failures

Source: compiled by the authors.

The average values of the lower and upper bounds are determined for the projected trend lines in the interests of national security [8].

To identify non-standard practices of interaction of economic agents in the labour market by the end of 2022, the following points should be considered:

- If the values of cash flow in labour relations fall within the range from  $-0.176$  to  $0.3682$  inclusive, then this is characteristic of the period of standard practices of interaction between economic agents. The process of interaction between actors is normal.

- If the values of cash flow fall into the range from  $0.3682$  to  $-0.176$ , then we can talk about the emergence of non-standard practices of interaction between economic subjects. There is an increase in labour mobility in the labour market, which is reflected in an increase in the volatility of the cash flow in question.

When irregular engagement practices emerge, the likelihood of disrupting the sustainability of the national economy increases. Given the importance of stable employment in times of crisis, it is advisable to apply intervention mechanisms aimed at

stabilising the economic situation using rapid intervention measures. Detailed elaboration of both the organisation of operational monitoring and the implementation of necessary state intervention tools is needed.

### PRACTICAL SUGGESTIONS

The calculations show that it is possible to use labour-flow information to monitor the operational condition of the economy. However, several practical aspects need to be taken into account (Table 3).

*Accounting for other sectors of the economy.* The focus of this study is on accounting for the dynamics of the money flows in labour relations. However, analysis of the sustainability of the economy also implies monitoring the condition and status of industrial and financial relations. It is possible to analyse monthly data on cash flows in systemically important organisations [9].

*Forming a set of actors.* The Bank of Russia can monitor the activities of a target group of economic entities. The list of subjects can be formed considering the needs of the authorities with the necessary competencies. The Bank of Russia can analyze the variability

of cash flow in a particular federal district, region [10]. If the data set is expanded, it is possible to analyze the dynamics of cash flow, including at the level of individual municipalities.

*Development of a classifier of operational impact tools.* In fact, it is a matter of restoring the continuity of interaction between economic agents. The Bank of Russia receives information on the emergence of non-standard interaction practices through a cash flow analysis and passes the information on to the relevant authority. For labour relations the Ministry of Labour and Social Protection of the Russian Federation is the relevant authority. Having received the said information, the authority must decide on promptly responding to the threat that has arisen. It is the speed of decision-making that directly affects the effectiveness of public policy, as was the case in the initial phase of the COVID-19 pandemic [11]. To enable a rapid response, instruments of intervention must be developed in advance, and the conditions under which they can be used must be defined. One example is the specialised refinancing instruments implemented by the Bank of Russia [12].

*Developing platform solutions for labour relations.* Various platform solutions have

developed in international practice. By encouraging the development of digital platforms in the field of labour relations, the state can help to reduce the potential negative impact of precarisation in the labour market by reducing the transaction costs associated with finding new jobs.

The implementation of the aspects described above will make it possible to implement a comprehensive system of tools to identify the risk of irregular interaction practices at an early stage, and subsequently use effective means of intervention. The latter is necessary to ensure sustainable development of the national economy.

## CONCLUSIONS

The study has demonstrated the possibility of using information on cash flows in the sphere of labour relations to carry out operational monitoring of the state of the economy. Thus, the data on the dynamics of interaction in labour relations is an indicator of the implementation of crisis phenomena in the economy. Given the current trend towards greater flexibility in labour relations, the importance of this indicator will increase. Further research should be aimed at elaborating a system of operational tools to ensure the sustainability of the national economic development.

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