Financing Sustainable Development Amid the Crisis of 2020. A Research Note

Elena G. Popkova1, Al-Muttar Mohammed Yousef Oudah2, Liliya V. Ermolina3, and Bruno S. Sergi4,5

1 Moscow State Institute of International Relations (MGIMO), Moscow, Russia
elenapopkova@yahoo.com
2 Al-Ayen University, Nasiriya, Dhi Qar, Iraq
mohammed.yousif@mail.ru
3 Samara State Technical University, Samara, Russia
Ermolina@mail.ru
4 Harvard University, Cambridge, USA
bsergi@fas.harvard.edu
5 University of Messina, Messina, Italy

Abstract. Purpose: The purpose of this chapter is to study the problem of sustainable development financing in the conditions of the budget deficit and investment collapse during the 2020 crisis and to determine the perspectives of solving this problem.

Design/Methodology/Approach: The authors determine regression dependence of the sustainable development manifestations on the possibilities of sustainable development financing: state budget surplus as the difference between revenues and expenditures, government debt, and volume of private investments. Forecasts of change of the indicators’ values, which characterize the opportunities for sustainable development financing, are developed. The established regression dependence helps to determine the consequences for sustainable development.

Findings: A forecast of financing and sustainable development amid the crisis of 2020 is compiled. The budget deficit will be more vivid (surplus budget will decrease by 220.61%, and government debt will grow by 85.42%); the investment will shrink by 41.96%. State financing has more significant influence (regression coefficient equals 379.34 for state budget surplus and 67.41 for government debt on average); private investments (regression coefficient is −266.64 on average).

Originality/Value: A far-reaching influence of deficit of financing for sustainable development is moderately negative on the whole – the expected decrease of all indicators of sustainable development under the control of the 2020 crisis compared to 2019, will constitute −0.55%. The perspectives of solving the problem of sustainable development financing in the conditions of the budget deficit and investment collapse under the influence of the 2020 crisis are connected to balancing the revenues and expenditures of government debt, limitation of borrowings, reduction of the volume of government debt, and attraction of investments in economy and restriction of their outflow.

Keywords: Problems of financing · Sustainable development · Budget deficit · Investment collapse · 2020 economic crisis
1 Introduction

A challenge of sustainable development appears during the implementation of the market model. On the one hand, sustainability is a public benefit, for it creates advantages for all economic actors. For example, fighting climate changes improves the environment for population and business, and an increase of openness and justice in society provides everyone with equal opportunities. The results in the sphere of sustainable development cannot be sold as economic benefits. They cannot directly offer direct commercial revenue. Thus, sustainable development measures are financed by governments and depend on the budget’s capabilities.

On the other hand, during increased consumer awareness and development of the responsible consumption culture, the possibility of obtaining indirect commercial profits from the initiatives in the sphere of sustainable development grows. In this case, corporate social and ecological responsibility stimulates the creation of a company’s marketing advantages in the form of an increase of reputation, growth of consumers’ loyalty, and an increase in the volume of sales, profit, and profitability. Also, a responsible society stimulates the popularity of private non-profit initiatives on the economy’s sustainability support, which boosts private investments in sustainable development.

The above contradiction causes uncertainty about the consequences of the 2020 economic crisis for sustainable development. Given the high social responsibilities of governments around the world, it is possible to expect soaring budget deficits in 2020. Also, the risks of entrepreneurship’s losses are extremely high. This creates high barriers to sustainable development financing. Though the state budget surplus and losses of private businesses are yet to be calculated, it is possible to expect significant financial losses. The 2020 economic crisis will definitively cause uncertainty and risks to sustainable development financing.

The topic’s importance is that financing is crucial and the key criterion for implementing the corresponding measures. As this crisis creates significant risks of funding for sustainable development, it is necessary to evaluate these risks and determine a full-scale implementation of sustainable development measures.

Acknowledging the importance of the above issues, the purpose of this chapter is to study the problem of sustainable development financing in deficit and investment collapse under the influence of the 2020 crisis and to determine some perspectives.

2 Materials and Method

The contradiction of sustainable development, caused by a combination of commercial and non-commercial characteristics, is studied in the works Andronova et al. (2019), Frolov et al. (2017), Inshakov et al. (2019), Morozova et al. (2019), Petrenko et al. (2018), Popkova et al. (2014), Popkova et al. (2017), Popkova et al. (2016), Ragulina (2019), Ragulina et al. (2019), and Zavyalova et al. (2018). The issues of sustainable
development financing are studied in the works Haabazoka (2019), Sergi et al. (2019a, 2019b, 2019c), Popkova (2017), Borodin and Morozova (2017), Lukyanenko (2017), Pozdnyakova et al. (2017).

The differences in the significance of government and private financing for sustainable development have not been determined. The consequences of the 2020 crisis and the perspectives of overcoming them on managing the sustainability’ financial support have not been established. The research objects in this paper are the top 10 countries that suffered (by the criterion of COVID-19 morbidity) from the 2020 economic crisis, according to the statistics of the World Health Organization (2020).

For the practical purposes of this paper, we set regression dependence of the sustainable development on the possibilities of sustainable development financing: the surplus as the difference between revenues and expenditures, government debt, and the volume of private investments (Table 1).

### Table 1. Statistics of sustainable development financing in the top 10 countries that suffered from COVID-19 in 2019.

| Manifestations of sustainable development | Financing of sustainable development |
|------------------------------------------|-------------------------------------|
| Global Competitiveness Index 4.0, points, 1–100 | General government revenue, percent of GDP |
| Economic growth rate, % | General government total expenditure, percent of GDP |
| GDP per capita, USD | Surplus of the state budget, % of GDP |
| Sustainable development index, points 1–100 | General government gross debt, percent of GDP |
| | Total investment, percent of GDP |

| y1 | y2 | y3 | y4 | y5 | x1 | x2 | x3 |
|----|----|----|----|----|----|----|----|
| USA | 83.7 | 2.121 | 64,212.535 | 74.5 | 29.924 | 35.224 | -5.300 | 110.579 | 21.002 |
| Brazil | 60.9 | 1.954 | 11,110.946 | 70.6 | 32.300 | 38.835 | -6.535 | 83.086 | 19.554 |
| Russia | 66.7 | 1.500 | 11,558.835 | 70.9 | 31.778 | 32.261 | -0.483 | 17.754 | 21.189 |
| UK | 81.2 | 1.606 | 38,965.146 | 79.4 | 36.823 | 37.987 | -1.164 | 87.689 | 16.965 |
| Spain | 75.3 | 2.045 | 28,619.088 | 77.8 | 38.084 | 40.505 | -2.421 | 96.774 | 20.734 |
| Italy | 71.5 | 0.800 | 30,941.744 | 75.8 | 47.580 | 48.235 | -0.655 | 129.371 | 18.094 |
| Germany | 81.8 | 1.415 | 43,372.885 | 81.1 | 45.128 | 44.351 | 0.777 | 59.101 | 19.348 |
| India | 61.4 | 7.791 | 2,173.500 | 61.1 | 20.855 | 26.800 | -6.005 | 64.278 | 32.093 |
| Turkey | 62.1 | 3.428 | 10,645.480 | 68.5 | 31.945 | 33.362 | -1.417 | 28.620 | 29.229 |
| France | 78.8 | 1.749 | 39,121.158 | 81.5 | 53.131 | 55.348 | -2.217 | 96.601 | 21.813 |
| Average | 72.34 | 2.44 | 28,072.13 | 74.12 | 36.75 | 39.30 | -2.54 | 77.39 | 22.00 |
| Standard deviation | 9.04 | 2.00 | 19,218.95 | 6.42 | 9.57 | 8.32 | 2.53 | 35.16 | 4.84 |

Source: compiled by the authors on data taken from the Institute of Scientific Communications (2020), International Monetary Fund (2020)

Based on direct averages and standard deviations (Table 1), we set automatic forecasts of change of the values of indicators that characterize the possibilities for sustainable development financing in 2020. The established regression dependencies are used for determining the consequences for sustainable development.

### 3 Results

For determining the scale of the problem of sustainable development financing, let us use the results of forecasting of these indicators’ change in 2020. Figures 1, 2 and 3 show forecasts “other conditions being equal.” During a crisis, it is possible to expect the worst values out of these indicators’ probable values.
During an economic crisis, state revenues contract and expenditures mount. In Fig. 1, the least out of rather probable (probability equals 3% with “all other conditions being equal,” but strives to 100% during a crisis) values of the state budget surplus ($x_1$) is $-8.15\%$ of GDP.

![Fig. 1. Forecast of state budget surplus ($x_1$) for 2020, % of GDP. Source: calculated by the authors.](image1)

During an economic crisis, government debt soars because of high social requirements. There is an alternative in the form of an increase in taxes or a reduction of expenditures. But this would not be acceptable during the 2020 economic crisis due to notable burdens on the government’s social requirements. In Fig. 2, the largest out of rather probable (probability equals 3% with “all other conditions being equal,” but strives to 100% during a crisis) values of government debt ($x_2$) is $143.49\%$ of GDP.

![Fig. 2. Forecast of the government debt ($x_2$) as of 2020, % of GDP. Source: calculated and built by the authors.](image2)
During an economic crisis, investments in the economy drop down due to high investment risks and uncertainty. In Fig. 3, the smallest out of rather probable (probability equals 4% with “all other conditions being equal,” but strives to 100% during a crisis) values of the volume of investments in economy ($x_3$) is 12.77% of GDP.

Based on the data from Table 1, we obtain the following multiple linear regression, which reflect the influence of financing on sustainability of economy’s development:

- $y_1 = 77.85 + 1.30*x_1 + 0.11*x_2 - 0.49*x_3$, correlation – 70.02%;
- $y_2 = -5.99-0.17*x_1 + 0*x_2 + 0.35*x_3$, correlation – 92.15%;
- $y_3 = 34,521.01 + 1,515.06*x_1 + 269.45*x_2-1,065.77*x_3$, correlation – 68.66%;
- $y_4 = 86.62 + 1.17*x_1 + 0.06*x_2 - 0.63*x_3$, correlation – 86.97%.

For modeling the forecast scenario of sustainable development through 2020, we plug into the regression equation the forecast values of indicators $x_1$, $x_2$, and $x_3$ in the obtained regression models and thus compiled a perspective (the most probable) scenario of sustainable development in light of the budget deficit and investment collapse under the impact of the 2020 crisis (Table 2).

![Fig. 3. Forecast of investments in economy ($x_3$) for 2020, % of GDP. Source: calculated by the authors.](image)

**Table 2.** The scenario of sustainable development through 2020, according to the authors’ forecast.

| Indicator                        | Symbol | The average value in 2019 | Forecast value in 2020 | Growth in 2020 as compared to 2019, % |
|----------------------------------|--------|---------------------------|------------------------|--------------------------------------|
| State budget surplus             | $x_1$  | $-2.54$                   | $-8.15$                | $220.61$                             |
| Government debt                  | $x_2$  | $77.39$                   | $143.49$               | $85.42$                              |
| The volume of investments in the economy | $x_3$  | $22.00$                   | $12.77$                | $-41.96$                             |
| Global competitiveness index     | $y_1$  | $72.34$                   | $76.93$                | $6.34$                               |
| Economic growth rate             | $y_2$  | $2.44$                    | $0.47$                 | $-80.78$                             |
| GDP per capita                   | $y_3$  | $28,072.13$               | $47,226.92$            | $68.23$                              |
| Sustainable development index    | $y_4$  | $74.12$                   | $77.08$                | $4.00$                               |

Source: calculated by the authors
The growth of the indicators, according to the compiled scenario, is shown in Fig. 4.

![Figure 4](image)

**Fig. 4.** Growth of the indicators of financing and sustainable development under the influence of the 2020 crisis, %. Source: calculated by the authors.

According to Fig. 4, the influence of budget deficit and investment collapse on sustainable development is moderate and positive for most of the indicators, which could be explained by a margin of error. The most vivid negative influence is seen with the economic growth rate, which reduces by 80.785 in 2020 as compared to 2019.

## 4 Conclusion

We have forecasted the financing of sustainable development according to which budget deficit will be more vivid (state budget surplus will decrease by 220.61%, and government debt grows by 85.42%); than investment collapse (the volume of investments in economy will shrink by 41.96%). Government financing has a considerable influence (regression coefficient equals 379.34 for state budget surplus and 67.41 for government debt on average) than private investments (regression coefficient equals −266.64 on average).

The aggregate influence of financing for sustainable development is moderately negative on the whole – the expected decline of the values of all indicators of sustainable development throughout the 2020 crisis, as compared to 2019, will constitute −0.55%. The perspectives of solving the problem of sustainable development financing in the conditions of the budget deficit and investment collapse under the influence of the 2020 crisis are connected to balancing the revenues and expenditures of government debt, limitation of borrowings, reduction of the volume of government debt, and attraction of investments in economy and restriction of their outflow.
Acknowledgments. The research was performed with financial support from the Russian Fund of Fundamental Research within the scientific project No. 18–010-00103 A.

References

Andronova, I.V., Chernova, V.Y., Starostin, V.S., Degtereva, E.A.: Study of sector-specific innovation efforts: The case from Russian economy. Entrep. Sustain. Issues 7(1), 540–552 (2019)

Frolov, D.P., Popkova, E.G., Strekalova, A.S., Marushchak, I.V.: Strategic planning of regional ecological development: adaptation of Elinor Ostrom’s principles in Russia. Contributions to Economics, (9783319552569), pp. 39–45 (2017)

Haabazoka, L.: Project finance for Africa’s construction sector: can stabilization funds work? In: Popkova, E. (eds.) The Future of the Global Financial System: Downfall or Harmony. ISC 2018. Lecture Notes in Networks and Systems, vol. 57. Springer, Cham (2019). Online ISBN 978-3-030-00102-5. https://doi.org/10.1007/978-3-030-00102-5_4

Inshakov, O.V., Bogachkova, L.Y., Popkova, E.G.: The transformation of the global energy markets and the problem of ensuring the sustainability of their development. Lecture Notes in Networks and Systems, vol. 44, pp. 135–148 (2019)

Institute of Scientific Communications: Dataset “Big data of the modern world economy: digital platform for intelligent analytics – 2020” (2020). https://www.archilab.online/en/data/sounting-data-set. Accessed 01 June 2020

International Monetary Fund: World Economic Outlook Database (2020). https://www.imf.org/external/pubs/ft/weo/2017/01/weodata/weoselgr.aspx. Accessed 01 June 2020

Morozova, I.A., Popkova, E.G., Litvinova, T.N.: Sustainable development of global entrepreneurship: infrastructure and perspectives. Int. Entrep. Manag. J. 15(2), 589–597 (2019)

Petrenko, E., Pritvorova, T., Dzhazykbaeva, B.: Sustainable development processes: service sector in post-industrial economy. J. Secur. Sustain. Issues 7(4), 781–791 (2018). https://jssidoi.org/jssi/papers/papers/view/309

Popkova, E.G., Dubova, Y.I., Yakovleva, E.A., Azarova, N.A., Titova, E.V.: Role of ecological marketing in formation and development of ecological cluster. Asian Soc. Sci. 10(23), 1–8 (2014)

Popkova, E.G., Poluyufa, L., Beshanova, Y., Popova, L.V., Kolesnikova, E.: Innovations as a basis for marketing strategies of Russian oil companies in the conditions of oil prices reduction. Contributions to Economics, (9783319606958), pp. 449–455 (2017)

Popkova, E.G., Shakhovskaya, L.S., Abramov, S.A., Natsubidze, A.S.: Ecological clusters as a tool of improving the environmental safety in developing countries. Environ. Dev. Sustain. 18(4), 1049–1057 (2016)

Pozdnyakova, U.A., Popkova, E.G., Kuzlaeva, I.M., Lisova, O.M., Saveleva, N.A.: Strategic management of clustering policy during provision of sustainable development. Contributions to Economics, (9783319454610), pp. 413–421 (2017)

Ragulina, Y.V.: Priorities of development of industry 4.0 in modern economic systems with different progress in formation of knowledge economy. Studies in Systems, Decision and Control, vol. 169, pp. 167–174 (2019)

Ragulina, Y.V., Alekseev, A.N., Strizhkina, I.V., Tumanov, A.I.: Methodology of criterial evaluation of consequences of the industrial revolution of the 21st century. Studies in Systems, Decision and Control, vol. 169, pp. 235–244 (2019)
Sergi, B.S., Popkova, E.G., Sozinova, A.A., Fetisova, O.V.: Modeling Russian industrial, tech, and financial cooperation with the Asia-Pacific region. In: Sergi, B.S. (ed.) Tech, Smart Cities, and Regional Development in Contemporary Russia, pp. 195-223. Emerald Publishing Limited, Bingley (2019a)

Sergi, B.S., Popkova, E.G., Vovchenko, N., Ponomareva, M.: Central Asia and China: financial development through cooperation with Russia. In: Barnett, W.A., Sergi, B.S. (eds.) Asia-Pacific Contemporary Finance and Development (International Symposia in Economic Theory and Econometrics, vol. 26), pp. 141–164. Emerald Publishing Limited, Bingley (2019b)

Sergi, B.S., Popkova, E.G., Borzenko, K.V., Przhedetskaya, N.V.: Public-private partnerships as a mechanism of financing sustainable development. In Ziolo, M., Sergi, B.S. (eds.) Financing Sustainable Development: Key Challenges and Prospects, pp. 313–339. Palgrave Macmillan (2019c)

World Health Organization: Coronavirus Disease (COVID-19) Dashboard. Data last updated 2020/5/30, 9:37 am CEST (2020). https://covid19.who.int/. Accessed 30 May 2020

Zavyalova, E.B., Studenikin, N.V., Starikova, E.A.: Business participation in implementation of socially oriented Sustainable Development Goals in countries of Central Asia and the Caucasus region. Central Asia Caucasus 19(2), 56–63 (2018)

Lukyanenko, N.A.: Aktualnie problemy razvitiya ozdorovitelnogo turizma [Topical problems of health tourism development.] In: Popkova, E.G. (ed.) INSSCCOM 2017. XIII All-Russian Electronic Scientific and Practical Conference “Green” Economy as a Practical Vector of Sustainable Development (2017). https://archilab.online/konferentsii-2017-goda/52-2017-xiii/567-aktualnye-problemy-razvitiya-ozdorovitelnogo-turizma. Accessed 05 June 2020

Borodin, I.P., Morozova, I.A.: Razrabotka prilogeniy po razvitiy KSO na primere OAO “MTS” [Development of CSR development applications using the example of MTS OJSC.] In: Popkova, E.G. (ed.) INSSCCOM 2017. XIII All-Russian Electronic Scientific and Practical Conference “Green” Economy As a Practical Vector of Sustainable Development (2017). https://archilab.online/konferentsii-2017-goda/52-2017-xiii/568-razrabotka-predlozhenij-po-razvitiyu-kso-na-primere-oao-mts. Accessed 05 June 2020

Popkova, Z.V.: Marketing v deyatelnosti kadrovikh struktur [Marketing in the activities of personnel structures.] In: Popkova, E.G. (ed.) INSSCCOM 2017. XVI All-Russian Electronic Seminar-Conference “Marketing AND PR: New Tools AND Practical Solutions (2017). https://archilab.online/konferentsii-2017-goda/55-2017-xvi/570-marketing-v-deyatelnosti-kadrovikh-struktur. Accessed 05 June 2020