

FETDE 2020
International Conference on Finance, Entrepreneurship and Technologies in
Digital Economy

STATE FINANCIAL RISK MANAGEMENT IN THE CONTEXT OF
THE FOURTH INDUSTRIAL REVOLUTION

Olga Arkadeva (a)*, Natalia Berezina (b)
*Corresponding author

(a) Chuvash State University named after I.N. Ulyanov, Cheboksary, Russia, knedlix@yandex.ru
(b) Chuvash State University named after I.N. Ulyanov, Cheboksary, Russia

Abstract

The article addresses to the problem of the transformation of state activity in the context of the development of information technologies. Particular attention is paid to risk management as a mechanism that can effectively use the technologies of the 4th industrial revolution in order to optimize a number of functions of state authorities. The authors investigated trends in the development of information technologies and the specifics of their application in financial sector of economy and financial relations from the point of state risk management. The main results confirm the hypothesis that state regulatory activity can also pose risks and inadequate financial risk management may provoke an escalation of crises. State does not have a real incentive to adapt to changes caused by the 4th industrial revolution except the feedback from society. Developing financial risk management and increasing the share of its presence in the economy, a state inevitably faces a contradiction in the regulation of the risks. Meanwhile, the risks of the 4th industrial revolution can be seen as an opportunity for positive transformation to the modernization of the education system and to the creation of new jobs.

2357-1330 © 2021 Published by European Publisher.

Keywords: State risk management, 4th industrial revolution, financial sector, technology, risks



1. Introduction

The necessity of risk management carried out by state in the conditions of a sharp increase of risks and threats is beyond doubt. The public request for protection against risks of various kinds is differentiated by countries, but its key provisions, reflected in the 17 goals of sustainable development of the United Nations, are formulated quite clearly.

Modern society differently appraises the efforts of state to manage risks in various fields. The financial sector is not an exception – for example, the global financial crisis showed that US institutions had the capacity to adapt to rapidly changing financial circumstances (Shenai, 2018). On the contrary in the United Kingdom 92% of businesses across a range of sectors think they will lose revenue if regulators don't keep pace with disruptive change in the next two to three years (Regulation for the fourth industrial revolution..., 2019). Information technologies can become a tool for the more effective state risk management, so it is necessary to clearly understand the scope and goals of their application.

2. Methods

The authors investigated trends in the development of information technologies and the specifics of their application in financial sector of economy and financial relations. Financial relations can be the source of risk themselves, because the premise of risk is immanently inherent to the essence of finance. One of the causes of financial crises, especially the most recent ones, was a misuse of finance instruments (Caselli & Gatti, 2017). Inadequate financial management provokes an escalation of crises. Some researchers got the results that financial development and economic growth are negatively associated in the long run (Swamy & Dharani, 2020).

State regulatory activity can also pose risks. So blockchain, which is the one of the key technologies of the 4th industrial revolution, can potentially increase the efficiency of entrepreneurial activity. Blockchain-based, cost-effective 'know your customer' (KYC) policies check could allow to register the necessary client's information on the shared database and to avoid the multiple banks' check of the same client. A shared and trusted KYC registry could encourage banks to participate in supply chain finance (SCF) programmes, increasing competition and thus providing better financing rates (Hofmann et al., 2018). At the same time, the regulatory activity of state does not support the development of this technology - for example, the Bank of Russia draws the attention of citizens and all participants of the financial market to increased risks of using and investing in cryptocurrencies (On the use of private "virtual currencies" (cryptocurrencies) / Central Bank of the Russian Federation (Bank of Russia), 2017).

The essential characteristic of the modern world is an active development of digital technologies: robotics, artificial intelligence, machine learning, the Internet of Things, cyber-physical systems, and the blockchain. Researchers are increasingly talking about the 4th industrial revolution. Machine intelligence will become the defining technology of the 4th Industrial Revolution, much as steam was for the 1st, electricity for the 2nd, and the microprocessor for the 3rd Industrial Revolutions. It is important that the drivers for the 4th Industrial Revolution are not individual technologies, but the fusion of a number of advanced technologies together with novel problem solving mindsets and approaches, which are likely to have a significant impact on businesses and society (Skilton & Hovsepian, 2018).

The conditions for state, business and society are changing in accordance with the environmental requirements. Sustainability transition transforms economy towards green, low carbon, resource efficient and to combat climate change. It is called quiet revolution in finance because is still emerging on peripheries of mainstream economy (Bem et al., 2018). For real and perceptible changes the accomplishment of three principal conditions is necessary: environmental risks are properly included in the investors' decision-making processes, market demand is effectively channelled towards green investments and additionality is adequately encouraged by policy makers (Migliorelli & Dessertine, 2019). The processes of disseminating of environmental ideas are ambiguous and can act as a tool for competition. The situation is aggravated if state represents the interests of large business or tries to spread ideas advantageous for itself without taking into account the interests of other countries, which entails the aggravation of the risks of monopolization of financial power.

It is important for business to understand the directions of technology development and to react and rebuild the business model to remain competitive and to open up new market opportunities. For example, the Finance Bundling project at Siemens AG was accompanied by combining and complicating the tasks that required a qualitatively new financial risk management, as a result of which in order to manage those risks systematically, the central team decided to establish an embedded risk management approach (Keuper & Lueg, 2013).

The financial sector also adapts to changes, since the financial results of its activities depend on the speed and the adequacy of the reaction. The financial industry is affected by several factors:

1. Increasing pressure from the regulators: the Basel III guidelines are forcing banks to build larger capital buffers and stronger liquidity (Basel III: Finalising post-crisis reforms, 2020).
2. Stricter rules on compliance: sanctions and KYC regulations are affecting the activity of banks.
3. The digital revolution: it is affecting the profitability of the banks and forces them to invest in IT platforms substantially.
4. New entrants: Fintech companies are jeopardizing banks' own territory. This process is irreversible and banks have to adapt to it by becoming ever more strategic partners to their clients (Caselli & Gatti, 2017).

The state is also aware of the changes and is often trying to intervene the course of technology development. There are strong objective reasons for this: market failures, relative scarcity of capital to fund socially valuable projects and an overall under-developed financial sector coupled with significant disparity in income distribution among different areas and regions of a country provide the justification for the government interventions (Giorgioni, 2017).

So the role of the state as regulator of the banking and financial sector, including protecting creditor rights, regulatory practices and consumer protection and envisaging a role in the long-term, infrastructural, investment, is increasing (Demirguc-Kunt, 2014). Financial regulators play an important role in ensuring the balance between promoting innovations and controlling risk, especially in emerging and developing economies (Alam et al., 2019). At the same time strengthening the role of state in long-term investments means leaching capital from the economy and depriving of opportunities to attract sources of financing for the commercial sector. In some cases this activity can upset the balance of reproduction and distribution processes. Governments may actually interfere with the workings of financial institutions and markets

leading to misallocation of resources, non-performing loans and lower financial develop due to decisions being taken on the basis of political objectives (Giorgioni, 2017).

3. Results

The main negative point of state's activity is that it does not have a real incentive to adapt to changes except the feedback from society. In the absence of well-established connection the actions of state may be a source of risk. To avoid this governments can ensure they themselves are not the drivers of fragility by running countercyclical fiscal policies, refinancing their debt to have a long weighted average maturity, building up their financial sector supervisory capacities, developing a robust domestic market for government securities, and ensuring central bank independence with a clear and credible inflation target with a floating exchange rate regime to act as a buffer against external shocks and facilitate macroeconomic adjustment (Shenai, 2018).

The state should use the experience of business that has economic incentives for adaptation. Organizations are looking for the way to mobilize their knowledge which is often distributed among the many organizational departments and business units. Centers of Excellence (CoE) are focussed on retaining, utilizing and developing knowledge, whereas Shared Services Centers (SSC) are focussed on the efficient service provisioning to many users. The basic premise of SSC is that services that are provided by one organization or department can be provided to users with relatively little effort resulting in economics of scale and scope (Keuper & Lueg, 2013). This approach is actively used by the Federal Treasury of the Russian Federation with its pilot projects in territorial administrations and can be used by other authorities.

In many cases, the state acts as an outdated employer, encouraging the development of work functions, which in the conditions of the 4th industrial revolution can be performed by artificial intelligence. Labor costs were about to be disrupted and the way we live and work would be permanently altered by the introduction of cyber-physical systems (CPSs) (Gleason, 2018). The requirements of business for the qualifications of employees are sharply increasing. The new tasks require a different set of skills and a new mind-set to develop new solutions for problems that we could not solve with today's technology. The most important ability is the ability to learn. Employees will need to be agile and able to jump between very different types of tasks and contexts (Gleason, 2018).

4. Discussion

State's requirements to the employees also affect the state capacity and effectiveness. But it is only a part of the main problem, which deals with risk management directly – the absence of clear and considered strategy of formation of Industry 4.0 inside government. As compared to developed countries, in which the process of Industry 4.0 formation was started earlier and aimed at marketing and social results, developing countries face the institutional and financial barriers and seek economic goals. At the same time the initiative approach to formation of Industry 4.0 in developing countries, within which the initiators of this process are economic subjects (companies), envisages larger flexibility and effectiveness as compared to the directive approach (state initiative), which is applied in developed countries (Popkova et al., 2019).

Developing financial risk management and at the same time increasing the share of its presence in the economy, a state inevitably faces a contradiction in the regulation of the risks of providing resources for its own functioning and the flow of funds to affiliates in the course of investment activities, including in the field of high technologies. Meanwhile, the risks of the 4th industrial revolution can be seen as an opportunity for positive transformation. The state can re-regulate the financial system in a more sustainable direction not only by an apt financial policy but also by accepting its inalienable responsibilities in the financial field (Giorgioni, 2017).

If a state brings together all the information bases necessary for its activity, arranges their work with the necessary software and ensures the exchange of data between them, there will indeed be a noticeable shortage of jobs. However technology has always created more jobs than it has replaced (Skilton & Hovsepian, 2018), only these types of work will require a fundamentally different level of education and qualification of workers. Therefore, in addition to technology development efforts state should be concerned in the modernization of the education system and the creation of new jobs in accordance with the requirements of a new stage in the development of society.

Acknowledgement

The article was supported by the Russian Foundation for Basic Research grant № 18-010-00124.

References

- Alam, N., Gupta, L., & Zameni, A. (2019). *Fintech and Islamic Finance Digitalization, Development and Disruption*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-030-24666-2>
- Basel III: Finalising post-crisis reforms. (2020). <https://www.bis.org/bcbs/publ/d424.htm>
- Bem, A., Daszyńska-Żygadło, K., Hajdíková, T., & Juhász, P. (Eds.). (2018). Finance and Sustainability. *Proceedings from the Finance and Sustainability Conference*, 284. <https://doi.org/10.1007/978-3-319-92228-7>
- Caselli, S., & Gatti, S. (Eds.). (2017). *Structured Finance – Techniques*. Products and Market Springer International Publishing. <https://doi.org/10.1007/978-3-319-54124-2>
- Demirguc-Kunt, A. (2014). Presidential address: Financial inclusion. *Atlantic Economic Journal*, 42, 349-356. <https://doi.org/10.1007/s11293-014-9429-z>
- Giorgioni, G. (Ed.). (2017). *Development Finance Challenges and Opportunities London*. Palgrave Macmillan. <https://doi.org/10.1057/978-1-137-58032-0>
- Gleason, N. (Ed.). (2018). *Higher Education in the Era of the Fourth Industrial Revolution*. Palgrave Macmillan. <https://doi.org/10.1007/978-981-13-0194-0>
- Hofmann, E., Strewe, U. M., & Bosia, N. (2018). *Supply Chain Finance and Blockchain Technology. The Case of Reverse Securitisation*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-62371-9>
- Keuper, F., & Lueg, K.-E. (Eds.). (2013). *Finance Bundling and Finance Transformation: Shared Services Next Level*. GablerVerlag. <https://doi.org/10.1007/978-3-658-00373-9>
- Migliorelli, M., & Dessertine, P. (Eds.). (2019). *The Rise of Green Finance in Europe (Opportunities and Challenges for Issuers, Investors and Marketplaces)*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-030-22510-0>
- On the use of private “virtual currencies” (cryptocurrencies). (2017). Central Bank of the Russian Federation (Bank of Russia). https://cbr.ru/press/PR/?file=04092017_183512if2017-09-04T18_31_05.htm
- Popkova, E. G., Ragulina, Y. V., & Bogoviz, A. V. (Eds.). (2019). *Industry 4.0: Industrial Revolution of the 21st Century*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-94310-7>

- Regulation for the fourth industrial revolution. (2019). *The UK Department for business, energy & industrial strategy policy paper*. <https://www.gov.uk/government/publications/regulation-for-the-fourth-industrial-revolution/regulation-for-the-fourth-industrial-revolution#fnref:23>
- Shenai, N. (2018). *Social Finance (Shadow Banking During the Global Financial Crisis)*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-319-91346-9>
- Skilton, M., & Hovsepian, F. (2018). *The 4th Industrial Revolution: Responding to the Impact of Artificial Intelligence on Business London*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-319-62479-2>
- Swamy, V., & Dharani, M. (2020). The tipping point of financial development?. *OECD countries International Economics and Economic Policy*, 17, 125-165. <https://doi.org/10.1007/s10368-018-0420-z>