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## **DIAGNOSTICS OF ECONOMIC SECURITY RISKS AS A MANIFESTATION OF MANAGEMENT QUALITY IN THE GLOBAL FINANCIAL MARKETS: FACTORS, THREATS, CRITERIA AND INDICATORS OF INDUSTRIAL AND MANUFACTURING ENGINEERING**

**Abstract:** *The purpose of this paper is to develop a new scientific and methodological approach to scientific research and practical implementation of state management practices in global financial markets, which would take into account the specifics and would realize the potential of the digital economy due to using the factors, threats, criteria, and indicators of industrial and manufacturing engineering. Originality of the research consists in the following: firstly, it envisages evaluation of the results of state management in global financial markets from the positions of quality, due to which high precision of evaluation of achieved, and it becomes applicable for thorough scientific research of causal connections of management in global financial markets. Secondly, a treatment of quality of state management in global financial markets through the prism of economic security risks is offered. Thirdly, the specifics of the digital economy are given: the essence of security of global financial markets in the conditions of the digital economy in the aspect of domination of new – cybernetic – risks are given, and the indicators of development and tools of state management in global financial markets are considered. The factors, threats, criteria, and indicators of industrial and manufacturing engineering are used for studying them.*

**Key words:** *Quality; Risks; Economic security; State management; Global financial markets; Industrial and manufacturing engineering.*

### **1. Introduction**

Financial markets largely determine the opportunities for development of economic systems, for they provide financial support not only for economic growth but also for innovative development. Globalization expands the limits and opportunities of financial markets, stimulating the

international movement of capital as the basic production factor. Significance of global financial markets is confirmed and emphasized by the fact that management of these markets is one of the key directions of state regulation of economic systems. In economic science, the issues of state management in global financial markets are thoroughly studied. However, there are

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certain gaps in this sphere.

During implementation of the regulatory practices in global financial markets, insufficient attention is paid to quality of management. The 2008 recession was followed by the COVID-19 global economic crisis, which started in 2020. This led to significant increase of cyclicity of the global economy, for financial and economic causes of the global crises were supplemented by other causes, in particular the viral threat. This aggravated the problem of deficit of state budgets around the world. That's why when evaluating state management practices the main attention is paid to saving budget assets.

Evaluation of the results of financial markets management is usually brought down to advantages for national economy, in particular the volume of attracted direct foreign investments and other advantages. The consequences for direct objects of regulation – participants of global financial markets – are not taken into account, though they characterize the primary consequences of management. Due to this, scientific treatment of causal connections of state management in global financial markets and the data of monitoring of the corresponding managerial practices are distorted.

High risk component of the investment activities – especially if these activities are connected to financing of innovations – is one of the most serious gaps on the path of global financial markets' development. That's why diagnostics and reduction of economic security risks is the most important manifestation of quality management in global financial markets. The level of economic security risks determines the volume of the investments inflow and their use in the economy. Risk-oriented management and increased level of economic security create favorable conditions for increase of the investment and innovative activity in economy, due to which economic growth is accelerated, and global competitive advantages of economic systems

and achieved and strengthened.

Another gap is connected to insufficient scientific elaboration of the specifics of the digital economy, in the conditions of which the modern financial markets develop and state management of their development is conducted. In the digital context, the factors, threats, criteria, and indicators of economic security risks and quality of management in global financial markets should be based on industrial and manufacturing engineering. In the digital economy, on the one hand, risks of economic security have a new – cyber – nature and are connected to protection of data and information in the electronic sphere. On the other hand, new indicators of global financial markets' development appear – they reflect the contribution of these markets to support for the digital economy, which replaced the pre-digital innovations.

State management in global financial markets also has new specifics, envisaging support for digitalization of these markets. Quality of management is higher depending on the level of its stimulation of global financial markets' digitalization. These gaps reduce the effectiveness of state management practices in global financial markets and slow down their development, for they do not allow realizing the potential of its improvement based on the opportunities of the digital economy.

This determines the importance of development of a new scientific and methodological approach to scientific research and practical implementation of state management practices in global financial markets, which would take into account the specifics and realize the potential of the digital economy due to the use of the factors, threats, criteria, and indicators of industrial and manufacturing engineering. The purpose of this paper is to develop such approach. The working hypothesis consists in the following: slow digitalization hinders the development of financial markets of developing countries, which results in limitation and non-

optimality (imbalance) of the global movement of capital.

Originality of this research consists in the following: firstly, it envisages evaluation of the results of state management in global financial markets from the positions of quality, due to which high precision of evaluation of achieved, and it becomes applicable for thorough scientific research of causal connections of management in global financial markets. Secondly, a treatment of quality of state management in global financial markets through the prism of economic security risks is offered. Thirdly, the specifics of the digital economy are given: the essence of security of global financial markets in the conditions of the digital economy in the aspect of domination of new – cybernetic – risks are given, and the indicators of development and tools of state management in global financial markets are considered. The factors, threats, criteria, and indicators of industrial and manufacturing engineering are used for studying them.

The research is organized in the following way. Introduction is followed by literature overview, which contains gap analysis. After this, information and empirical materials and the research methodology are described. Then, digital risks of economic security and their influence on the indicators of global financial markets' development in the aspect of industrial and manufacturing engineering are described.

Also, digital perspectives of the increase of quality of management in global financial markets with the help of risk management of economic security of based on industrial and manufacturing engineering are described. Policy implications for increasing the quality of state management in global financial markets based on industrial and manufacturing engineering in the digital economy are given. The last part of this paper is conclusions, which also contain the perspectives of further scientific studies.

## 2. Literature Review

Quality of state regulation of the market economy is studied in detail in the works Cheglakova et al. (2019), Lysova et al. (2019), Soboleva (2017), Sozinova et al (2016), and Sofiina (2020). Sutherland (2017) studies the consequences of Brexit for managing telecommunications markets in the UK. Shakil et al. (2019) prove that ecological, social, and managerial indicators do not influence the financial indicators of banks (based on an inter-country study of banks in countries with emerging market economy).

Lahiri (2017) notes the positive regulating influence of the market potential and preceding experience on the interconnection between the quality of management and participation in capital (based on M&A in countries of BRICS). Sozinova (2020a), Sozinova (2020 b), and Sozinova (2020c) study the market of m&a as a specific phenomenon in the modern Russian economy, substantiate the perspectives, and offer the scientific & methodological and practical recommendations for improving the Russian practice of m&a management based on the marketing methodology.

Wang and Liu (2019) suggest using the proactive or flexible market orientation for achieving a stronger innovative potential of services and note the regulatory role of contractual and relational management. Cowen (2019) draws the rules of market regulation and outlines the perspectives and danger of distributed market management based on blockchain technologies.

The theoretical and empirical issues of functioning and global financial markets' development are reflected in the following works. Loudon (2017) notes the influence of instability of the financial market on risk/profit ratio in stock markets of G7. Boamah (2017) determines global integration of financial markets of certain developing countries.

Sabbaghi and Sabbaghi (2018) determine the connection between market effectiveness and the global financial crisis (based on data from developed markets).

Liow and Angela (2017) substantiate the return and joint movement of the main public real estate market during the global financial crisis. Deshpande (2018) notes the interconnection between the leading production technologies, market's absorbing capacity, mass setting, time of entering the market, and financial and marketing characteristics of entrepreneurial subjects in the market. Salameh and Alzubi (2018) perform a study of volatility of stock market (based on the data of the financial market of Dubai).

Abdelhedi and Boujelbène-Abbes (2019) prove the transfer of shocks between financial market and oil market (by the example of China). Kim et al. (2019) think that liquidity in financial market influences the profitability of real estate market. Samanta and Johnston (2019) draw a connection between priorities of shareholders, corporate management, and growth of financial market. M. Ezzat (2022) suggests using a behavioral agent-oriented structure for interconnection between financial markets.

Guha et al. (2019) study the evolution of corporate management in India and its influence on growth of financial market (performing an empirical analysis for 1995-2014). Huang et al. (2019) perform an analysis of China's financial markets. Kawakatsu and Oliver (2018) draw a connection between population structure and financial markets (based on the data from Japan). Seth and Sighania (2017) study the crisis phenomena in global financial markets. Braga et al. (2017) study intuition and mood of investors in financial markets and perform an experiment with the emphasis on transactions in zero time.

Economic security and related risks for the modern market economy are described in the following works. Chang and Khan (2019)

study the China-Pakistan economic corridor and cooperation in the sphere of maritime security and substantiate the growing bilateral interests. Srinita (2018) note the interconnection between maternal, family, and socio-economic characteristics and food security in Aceh, Indonesia.

Specific risks of economic security, which emerge in the conditions of the digital economy, are studied in the works Alpidovskaya and Popkova (2019), Bratukhina et al. (2020), Inshakova and Bogoviz (2020), Popkova and Sergi (2020), Popkova (2017), Popkova (2019), Popkova (2020), Popkova et al. (2020), Popkova et al. (2017), Popkova and Sergi (2018), Popkova and Sergi (2019), Popkova et al. (2019), Ragulina (2019), Shulus et al. (2020), Sozinova (2018a), Sozinova et al. (2018), Sozinova (2018b), Sozinova et al. (2017a), Sozinova et al. (2017b), and Stolyarov et al. (2020).

Gibbs (2020) studies the specifics of economic cyber security (by the example of countries of the Middle-East). Gcaza et al. (2017) perform a general morphological analysis for determining the culture of cyber security. M'manga et al. (2019) offer a normative model for highly-effective managerial decisions in the sphere of cyber security.

Literature overview has shown that there is a reliable theoretical basis for this research. However, gap analysis has shown insufficient elaboration of fundamental and applied issues at the intersection of separate spheres of scientific knowledge that is a part of the formulated problem. One of the gaps is uncertainty of the notion and essence of quality of state management in global financial markets, which, obviously, is rather specific and cannot be equaled to general state regulation of the market economy.

Another gap is obscureness of the risks of economic security in global financial markets, though there is no doubt that they differ from generalized risks of economic security, of which the most popular

examples are food security and fighting crimes. Other gaps also include poor elaboration and insufficient study of the specific factors, threats, criteria, and indicators that are related to industrial and manufacturing engineering, which dominate in the conditions of the digital economy and determine the diagnostics and overcoming of economic security risks as a manifestation management quality in global financial markets. This research aims at filling these gaps.

### 3. Materials and methodology

In order to study the balance in global financial markets and take into account the specifics of this balance in the aspect of industrial and manufacturing engineering, the research object in this paper are eight developed and eight developing countries, which have the highest global digital competitiveness, according to the report by IMD (2020). The World Digital Competitiveness Report, prepared by IMD (2020), is the information and empirical basis of this research. This ensures the fullest consideration of the context of industrial and manufacturing engineering in the digital economy and compatibility of the indicators, which reduces during the use of data from different sources.

The indicators of global financial markets' development in the aspect of industrial and manufacturing engineering in the digital economy are the following indicators, assigned by IMD (2020) to sub-clause "Capital" of clause "Technology":

- IT and media stock market capitalization as the indicator of competitiveness and market cost of digital companies in stock market;
- Funding for technological development as the indicator of financial support for the digital economy;
- Banking and financial services as the indicator of accessibility of

borrowed (credit) resources for financing of the digital economy development;

- Venture capital as the indicator of accessibility of investments in digitalization as the key direction of the modern economy's innovative development.

It should be noted that the two remaining indicators, from sub-clause "Capital", are not considered in this paper, for country credit rating is not directly related to the digital economy, and investment in telecommunications repeat funding for technological development and thus are excluded, in order to observe all terms of the Gauss–Markov theorem during modeling of state management of global financial markets' development with the help of industrial and manufacturing engineering.

The following risks of economic security in the aspect of industrial and manufacturing engineering in the digital economy are considered:

- Cyber security as the indicator of preventing cyber attacks;
- Security of software as the indicator of personal data and information protection;
- Enforcing contracts as the indicator of state guarantee of execution of the terms of concluded contracts, including digital contracts (in particular, with the use of digital signature);
- Intellectual property rights as the indicator of state guarantee of observation of rights for digital innovations.

The factor of economic security risks in the aspect of industrial and manufacturing engineering is adaptation of the legal framework to digital business models. The data of this indicator are taken from The Global Competitiveness Report, prepared by World Economic Forum (2020). The selection of the described statistical data, necessary for this research, is given in Table 1. The research is performed based on the data for 2020 (as a result of 2019).

**Table 1.** Risks of economic security and state management of global financial markets’ development with the help of industrial and manufacturing engineering in developed and developing countries in 2020.

Category	Country	Indicators of global financial markets’ development, positions 1-63				Risks of economic security, positions 1-63				Risk factor, points 1-100
		IT & media stock market capitalization	Funding for technological development	Banking and financial services	Venture capital	Cyber security	Software piracy	Enforcing contracts	Intellectual property rights	
		y <sub>1</sub>	y <sub>2</sub>	y <sub>3</sub>	y <sub>4</sub>	x <sub>1</sub>	x <sub>2</sub>	x <sub>3</sub>	x <sub>4</sub>	
Developed countries	USA	6	2	1	1	34	1	15	13	78.0
	Singapore	26	1	2	5	6	17	1	6	76.5
	Sweden	12	7	8	6	36	6	31	7	67.9
	Denmark	45	9	13	9	17	8	13	4	60.2
	Switzerland	42	10	11	15	11	10	41	2	60.5
	Netherlands	8	6	5	4	8	13	46	5	65.5
	Finland	7	5	4	8	4	13	34	1	37.7
Norway	11	12	10	10	24	10	3	15	60.3	
Developing countries	China	33	24	42	38	16	56	6	48	59.5
	Qatar	-	8	17	16	3	38	56	22	64.9
	Kazakhstan	-	26	37	41	42	59	4	40	64.9
	Russia	43	51	57	56	44	53	17	52	48.1
	Saudi Arabia	-	22	20	25	7	38	43	34	65.3
	Thailand	23	29	7	22	30	56	29	47	43.8
	Chile	46	47	31	47	52	46	37	39	51.9
India	13	35	27	30	37	48	62	46	58.9	

Source: compiled by the authors based on IMD (2020), World Economic Forum (2020).

The research consists of three consecutive stages, at each of which the corresponding methodology is used. At the first stage, digital risks of economic security and their influence on the indicators of global financial markets’ development in the aspect of industrial and manufacturing engineering are determined with the help of regression analysis. For substantiating the digital perspectives of increase of quality of management in global financial markets with

the help of risk management of economic security based on industrial and manufacturing engineering, the differences in the level of global financial markets’ development between developed and developing markets are determined with the help of direct averages calculated and comparative analysis.

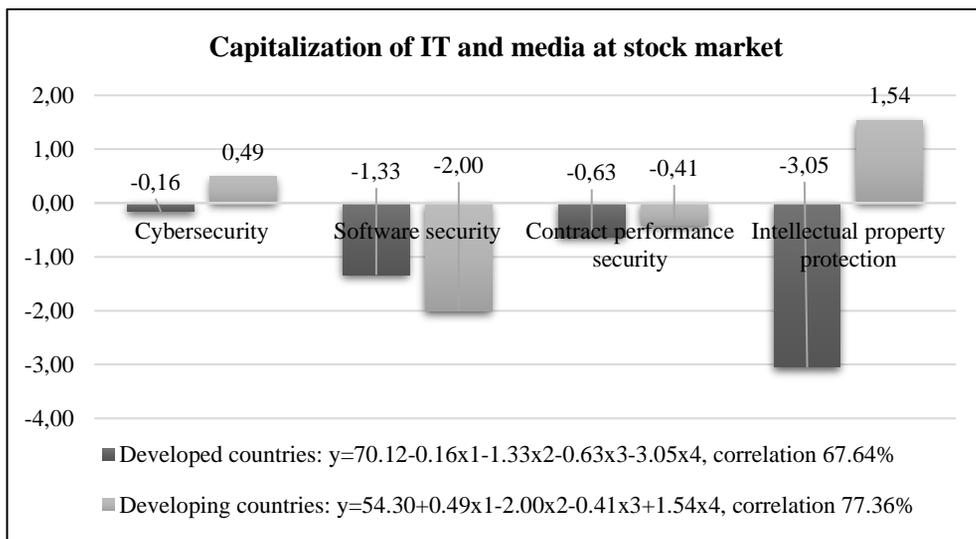
Based on the obtained regression equations, the target values of digital risks for financial markets of developing countries achieving

the level of development of these markets in developed countries until 2024 are determined (simplex method is used). Simplex method and regression analysis are used for determining the target level of legal framework's adaptability to digital business models in developing countries for overcoming the gap in the level of development of their financial markets as compared to developed countries, until 2024. For preparation of policy implications for increasing quality of state management in global financial markets based on industrial and manufacturing engineering in the digital economy, we use SWOT analysis. Strengths, weaknesses, opportunities, and threats to increase of quality of state management in global financial markets based on industrial and manufacturing engineering are determined.

#### 4. Results

##### 4.1 Digital risks of economic security and their influence on the indicators of global financial markets' development in the aspect of industrial and manufacturing engineering

For determining the influence of digital risks of economic security on the indicators of global financial markets' development in the aspect of industrial and manufacturing engineering, let us use the results obtained in the course of regression analysis. Figures 1-4 show regression dependencies in developed and developing countries for each indicator of global financial markets' development in the aspect of industrial and manufacturing engineering in the conditions of the digital economy. .



**Figure 1.** Regression dependence of IT and media stock market capitalization on economic security risks, positions 1-63.

Source: calculated and compiled by the authors.

As all indicators that are used in regression analysis are taken from the same report and have similar measuring units and logical treatment (the lower the indicator's level, the better – it means higher position of a country in the ranking), positive values of regression coefficients are a sign of positive influence,

and negative values are a sign of negative influence. The diagrams show only regression coefficients, for they reflect the connection between the indicators. Constants are shown in regression equations in diagrams' descriptions.

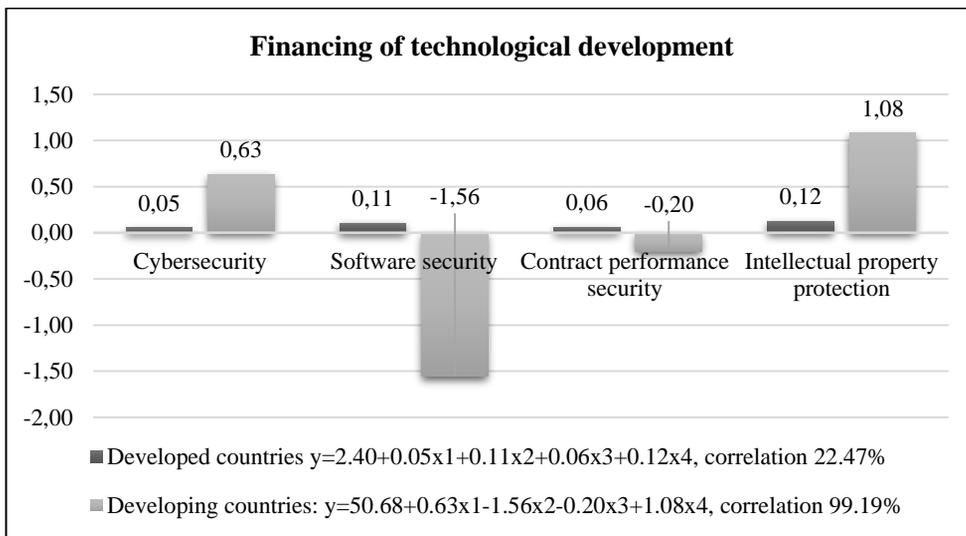
As shown in Figure 1, decrease of economic security risks in developed countries does not lead to increase of IT and media stock market capitalization, which is proved by negative values of all obtained regression coefficients. Improvement of the position in the cyber security ranking by 1 leads to decrease of the position of IT and media stock market capitalization (position in the ranking drops down) by 0.16 positions. Improvement of position in the ranking of security of software leads to decrease of IT and media stock market capitalization (position in the ranking drops down) by 1.33 positions.

Improvement of position in the ranking of enforcing contracts leads to decrease of IT and media stock market capitalization (position in the ranking drops down) by 0.63 positions. Improvement of position in the ranking of intellectual property rights leads to decrease of IT and media stock market capitalization (position in the ranking drops down) by 3.05 positions. Multiple correlation is moderately high – 67.64%.

In developing countries, decrease of economic security risks leads (moderately)

to increase of IT and media stock market capitalization, which influence on the considered indicator of global financial markets' development in the aspect of industrial and manufacturing engineering is contradictory – which is shown by negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of IT and media stock market capitalization (position in the ranking goes up) by 0.49 positions.

Improvement of position in the ranking of security of software by 1 leads to decrease of IT and media stock market capitalization (position in the ranking drops down) by 2 positions. Improvement of position in the ranking of enforcing contracts by 1 leads to decrease of IT and media stock market capitalization (position in the ranking drops down) by 0.41 positions. Improvement of position in the ranking of intellectual property rights by 1 leads to increase of IT and media stock market capitalization (position in the ranking goes up) by 1.54 positions. Multiple correlation is rather high – 77.36%.



**Figure 2.** Regression dependence of funding for technological development on economic security risks, positions 1-63

Source: calculated and compiled by the authors

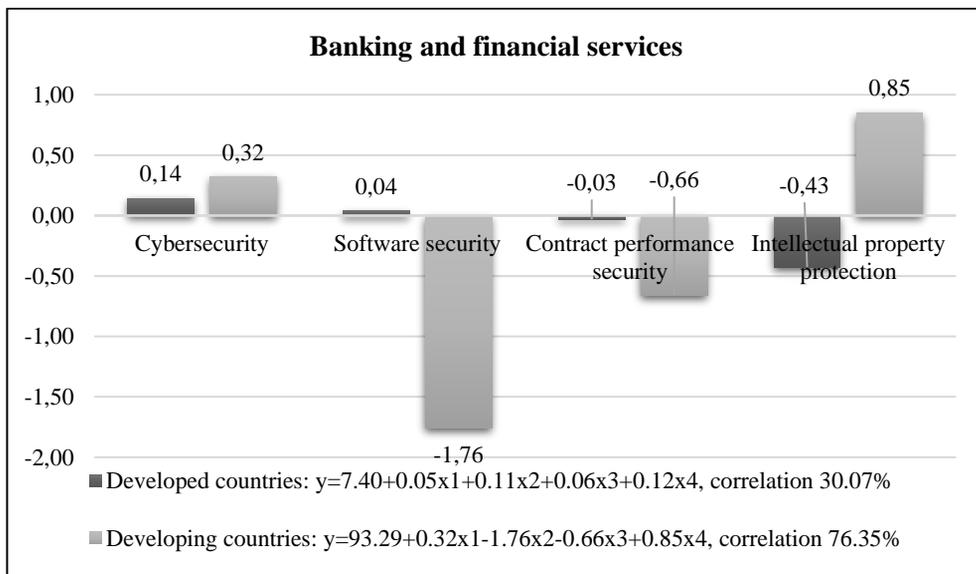
As shown in Figure 2, decrease of economic security risks in developed countries leads to improvement of funding for technological development, which is shown by the positive values of all obtained regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of funding for technological development (position in the ranking goes up) by 0.05 positions. Improvement of position in the ranking of software piracy by 1 leads to increase of funding for technological development (position in the ranking goes up) by 0.11 positions.

Improvement of position in the ranking of enforcing contracts by 1 leads to increase of funding for technological development (position in the ranking goes up) by 0.06 positions. Improvement of position in the ranking of intellectual property rights by 1 leads to increase of funding for technological development (position in the ranking goes up) by 0.12 positions. However, multiple correlation is small – 22.47%.

In developing countries, decrease of economic security risks moderately

stimulates the improvement of funding for technological development, which influence on the considered indicator of global financial markets’ development in the aspect of industrial and manufacturing engineering is contradictory, which is shown by the presence of negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of funding for technological development (improves, position in the ranking goes up) by 0.63 positions.

Improvement of position in the ranking of software piracy by 1 leads to decrease of funding for technological development (position in the ranking drops down) by 1.56 positions. Improvement of position in the ranking of enforcing contracts by 1 leads to decrease of funding for technological development (position in the ranking drops down) by 0.20. Improvement of position in the ranking of intellectual property rights by 1 leads to increase of funding for technological development (position in the ranking goes up) by 1.08 positions. Multiple correlation is very high – 99.19%.



**Figure 3.** Regression dependence of banking and financial services on economic security risks, positions 1-63

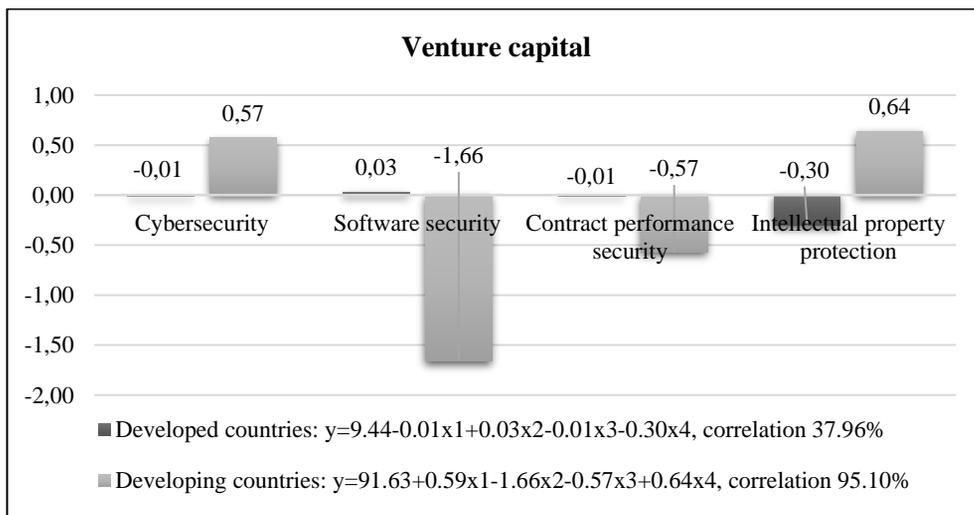
Source: calculated and compiled by the authors

In developed countries, decrease of economic security risks moderately stimulates the development of banking and financial services, which influence on the considered indicator of global financial markets' development in the aspect of industrial and manufacturing engineering is contradictory – which is shown by negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of the level of development of banking and financial services (position in the ranking goes up) by 0.14 positions.

Improvement of position in the ranking of security of software by 1 leads to increase of the level of development of banking and financial services (position in the ranking goes up) by 0.04 positions. Improvement of position in the ranking of enforcing contracts by 1 leads to decrease of the level of development of banking and financial services (position in the ranking drops down) by 0.03. Improvement of position in the ranking of intellectual property rights by 1 leads to decrease of the level of development of banking and financial services (position in the ranking drops down) by 0.43 positions. Multiple correlation is weak – 30.07%.

In developing countries, decrease of economic security risks moderately stimulates the development of banking and financial services, which influence on the considered indicator of global financial markets' development in the aspect of industrial and manufacturing engineering is contradictory, which is shown by negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of the level of development of banking and financial services (position in the ranking goes up) by 0.32 positions.

Improvement of position in the ranking of security of software by 1 leads to decrease of the level of development of banking and financial services (position in the ranking drops down) by 1.76 positions. Improvement (decrease) of position in the ranking of enforcing contracts by 1 leads to decrease of the level of development of banking and financial services (position in the ranking drops down) by 0.66. Improvement of position in the ranking of intellectual property rights by 1 leads to increase of the level of development of banking and financial services (position in the ranking goes up) by 0.85 positions. Multiple correlation is rather high – 76.35%.



**Figure 4.** Regression dependence of venture capital on economic security risks, positions 1-63.  
Source: calculated and compiled by the authors

In developed countries, decrease of economic security risks moderately stimulates the development of venture capital, which influence on the considered indicator of global financial markets' development in the aspect of industrial and manufacturing engineering is contradictory – which is shown by the presence of negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to decrease of accessibility of venture capital (position in the ranking drops down) by 0.01 positions.

Improvement of position in the ranking of security of software by 1 leads to increase of accessibility of venture capital (position in the ranking goes up) by 0.03 positions. Improvement of position in the ranking of enforcing contracts by 1 leads to decrease of accessibility of venture capital (position in the ranking drops down) by 0.01 positions. Improvement of position in the ranking of intellectual property rights by 1 leads to decrease of accessibility of venture capital (position in the ranking drops down) by 0.30 positions. Multiple correlation is small – 37.96%.

In developing countries, decrease of economic security risks moderately stimulates the development of venture capital, which influence on the considered indicator of global financial markets' development in the aspect of industrial and manufacturing engineering is contradictory, which is shown by negative and positive regression coefficients. Improvement of position in the cyber security ranking by 1 leads to increase of accessibility of venture capital (position in the ranking goes up) by 0.57 positions.

Improvement of position in the ranking of security of software by 1 leads to decrease of accessibility of venture capital (position in the ranking drops down) by 1.66 positions. Improvement of position in the ranking of enforcing contracts by 1 leads to decrease of accessibility of venture capital (position in the ranking drops down) by 0.57 positions.

Improvement of position in the ranking of intellectual property rights by 1 leads to increase of accessibility of venture capital (improves, position in the ranking goes up) by 0.64 positions. Multiple correlation is very high – 95.10%.

#### **4.2 Digital perspectives of increase of management quality in global financial markets with the help of risk management of economic security based on industrial and manufacturing engineering**

Digital perspectives of increase of management quality in global financial markets with the help of risk management of economic security based on industrial and manufacturing engineering should be oriented at provision of balance of the global economic system. This envisages taking the quality of management in global financial markets in developing countries up to the level of developed countries by 2024.

As shown in Table 1, average IT and media stock market capitalization in developed and developing countries coincides – 20<sup>th</sup> position. Average funding for technological development in developed countries is ranked 7<sup>th</sup>, and in developing countries – 30<sup>th</sup>. Average accessibility of banking and financial services is ranked 7<sup>th</sup>, and in developing countries – 30<sup>th</sup>. Average accessibility of venture capital is ranked 7<sup>th</sup>, and in developing countries – 34<sup>th</sup>.

That's why optimization of global financial markets' development in developing countries from the positions of managing the risks of economic security in the aspect of industrial and manufacturing engineering seeks four goals:

1. Developing countries' achieving the level of IT and media stock market capitalization in developed countries:  $y_1=20$ ;
2. Developing countries' achieving the level of funding for technological development in developed countries:  $y_2=7$ ;
3. Developing countries' achieving the level of development of banking and

financial services in developed countries:  $y_3=7$ ;

4. Developing countries' achieving the level of development of venture capital in developed countries:  $y_4=7$ .

The results of optimization with the help of simplex method based on regression equations (Figure 1-4) are presented in Table 2.

**Table 2.** Optimization of global financial markets' development in developing countries from the positions of managing the risks of economic security in the aspect of industrial and manufacturing engineering

Variable	Average value in 2020	Goal: $y_1=20$		Goal: $y_2=7$		Goal: $y_3=7$		Goal: $y_4=7$	
		Target value in 2024	Growth in 2024, %	Target value in 2024	Growth in 2024, %	Target value in 2024	Growth in 2024, %	Target value in 2024	Growth in 2024, %
$x_1$	29	Goal is achieved in 2020		15.00	-48.05	15.00	-48.05	<b>12.00</b>	-58.44
$x_2$	49	unchanged ( $x_2=49$ ) due to contradictory influence on the results							
$x_3$	32	unchanged ( $x_3=32$ ) due to contradictory influence on the results							
$x_4$	41	Goal is achieved in 2020		27.00	-34.15	19.00	-53.66	<b>13.00</b>	-68.29
$y_1$	20			-	-	-	-	-	-
$y_2$	30	-	-	-	-	-	-	-	-
$y_3$	30	-	-	-	-	6.84	-77.01	-	-
$y_4$	34	-	-	-	-	-	-	7.12	-79.28

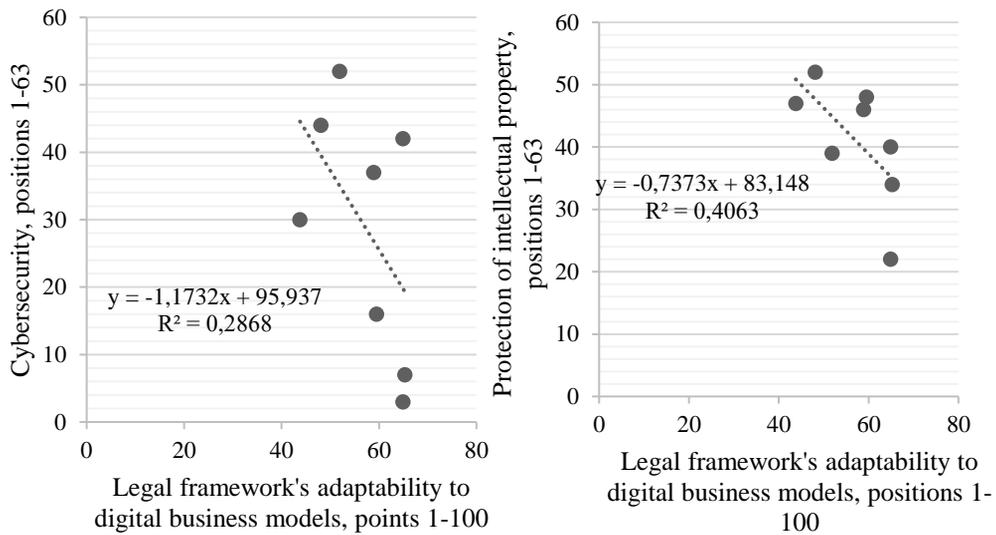
Source: calculated and compiled by the authors

As shown in Table 2, security of software is unchanged ( $x_2=49$ ) – as well as enforcing contracts ( $x_3=32$ ) – due to the contradictory influence on the results. Cyber security should be improved up to 12<sup>th</sup> position (by 58.44%), and intellectual property rights – to 13<sup>th</sup> position (by 68.29%) for simultaneous achievement of all four goals of optimization.

A tool of increase of cyber security and intellectual property rights is legal framework's adaptability to digital business models. Regression curves of dependence of these indicators are shown in Figure 5.

Optimization of quality of managing the risks of economic security through legal framework's adaptability to digital business models in developing countries in the aspect of industrial and manufacturing engineering is performed based on the data from Figure 4. The results are shown in Table 3.

The results of optimization in Table 3 have shown that cyber security improves up to 12<sup>th</sup> position, and intellectual property rights to 13<sup>th</sup> position at the same time during increase of legal framework's adaptability to digital business models by 66.16% - up to 95 points.



**Figure 5.** Regression curves of dependence of cyber security and intellectual property rights on legal framework’s adaptability to digital business models in developing countries  
Source: calculated and compiled by the authors

**Table 3.** Optimization of quality of managing economic security risks through legal framework’s adaptability to digital business models in developing countries in the aspect of industrial and manufacturing engineering.

Variable	Average value in 2020	Goal: $x_1=12$		Goal: $x_4=13$	
		Target value in 2024	Growth in 2024, %	Target value in 2024	Growth in 2024, %
Legal framework’s adaptability to digital business models	57.16	72.00	25.96	95.00	66.16
Cyber security ( $x_1$ )	28.88	11.47	-60.29	-	-
Intellectual property rights ( $x_4$ )	41.00	-	-	13.10	-68.04

Source: calculated and compiled by the authors.

**4.3 Policy implications for increase of quality of state management in global financial markets based on industrial and manufacturing engineering in the digital economy**

For developing recommendations on increase of quality of state management in global financial markets based on industrial and manufacturing engineering in the digital economy based on increase of cyber security and intellectual property rights, let us use the results of SWOT analysis (Table 4).

As shown in Table 4, a strength of the digital economy is accessibility and active implementation of international initiatives on intellectual property rights and provision of cyber security. A weakness is inaccessibility of services on intellectual property rights and provision of cyber security for wide groups of interested parties due to complexity and duration of intellectual rights registration and high cost of the services on its protection and provision of cyber security.

**Table 4.** SWOT analysis of the perspectives of increase of management quality in global financial markets with the help of industrial and manufacturing engineering.

Strengths, S	Weaknesses, W
– International initiatives on intellectual property rights and provision of cyber security.	– Inaccessibility of services on intellectual property rights and provision of cyber security for wide groups of interested parties.
Opportunities, O	Threats, T
<ul style="list-style-type: none"> <li>– adoption of international standards;</li> <li>– implementation of international investment projects;</li> <li>– development of international infrastructure based on public-private partnership;</li> <li>– provision of wide accessibility based on e-government.</li> </ul>	<ul style="list-style-type: none"> <li>– differentiation and contradiction of the regulatory field of intellectual property rights and provision of cyber security of different countries;</li> <li>– deficit of assets of state budget and lack of financing of intellectual property rights and provision of cyber security.</li> </ul>

Source: developed and compiled by the authors.

A threat is differentiation and contradiction of the regulatory field of intellectual property rights and provision of cyber security of different countries, as well as deficit of assets of state budget and lack of financing of intellectual property rights and provision of cyber security.

Opportunities include and policy implications for increasing the quality of state management in global financial markets based on industrial and manufacturing engineering in the digital economy include the following:

- adoption of international standards of intellectual property rights and provision of cyber security;
- implementation of international investment projects on intellectual property rights and provision of cyber security;
- development of international infrastructure for intellectual property rights and provision of cyber security based on public-private partnership;
- provision of wide accessibility of intellectual property rights and provision of cyber security based on e-government.

## 5. Conclusion

Thus, it has been proved that diagnostics of economic security risks is a significant

manifestation of management quality in global financial markets. The indicators of global financial markets' development are IT and media stock market capitalization, funding for technological development, banking and financial services, and venture capital. Quality of management in global financial markets is determined by successfulness of fighting risks of economic security, the criteria of which are cyber security, security of software, enforcing contracts, and intellectual property rights. Legal framework's adaptability to digital business models is a factor of risks and a tool of managing the global financial markets' development.

Digital risks of economic security influence the indicators of global financial markets' development in the aspect of industrial and manufacturing engineering in developed and developing countries. However, in developed countries – due to higher level of development of the digital economy – these risks are lower, which proves the hypothesis of this research. For provision of optimality (balance) of the global movement of capital, we offer optimization of global financial markets' development of developing countries from the positions of managing economic security risks in the aspect of industrial and manufacturing engineering.

For the purpose of optimization, cyber security should be improved up to 12<sup>th</sup> position (by 58.44%), and intellectual

property rights – up to 13<sup>th</sup> position (by 68.29%) in developing countries. For this, legal framework's adaptability to digital business models should be increased by 66.16% - up to 95 points. Differentiation and contradiction of the regulatory field of intellectual property rights and provision of cyber security of different countries, as well as deficit of state budget and lack of financing of intellectual property rights and provision of cyber security, are a threat to optimization. For overcoming these threats, we have offered policy implications for increasing the quality of state management in global financial markets based on industrial and manufacturing engineering in

the digital economy.

Thus, contribution of the performed research in development of economic science and practice consists in offering the theoretical & methodological and empirical recommendations for provision of balance of the global financial markets and achievement of free movement of capital in the global economic system. The framework character of the developed recommendations ensures their universal character, but requires their further detalization and adaptation to the specifics of each developing country – which should be done in further studies.

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